# ACADEMIC PERFORMANCE: A RETROSPECTIVE INVESTIGATION OF STUDY SKILLS AND LASSI PERFORMANCE

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A Dissertation

Presented to

The Faculty of the Department of Educational Leadership

Sam Houston State University

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In Partial Fulfillment

of the Requirements for the Degree of

Doctor of Education

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by

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August, 2016

ACADEMIC PERFORMANCE: A RETROSPECTIVE INVESTIGATION OF STUDY SKILLS AND LASSI PERFORMANCE

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## DEDICATION

To my mother, for telling me anything is possible as long as I set my mind to it.

To my father, for teaching me to take pride in my work, but sometimes it only has to be "good enough for government work."

To my wife, for…absolutely everything.

## ABSTRACT

Jordan, John Daniel, *Academic performance: A retrospective investigation of study skills and LASSI performance*. Doctorate of Education (Educational Leadership), August, 2016, Sam Houston State University, Huntsville, Texas.

Students are entering college and the workforce lacking skills critical to their success. This gap places a burden on higher education institutions to mitigate this problem. As such, programs designed specifically to enhance students' academic strategies are important. The purpose of this journal-ready dissertation was to provide needed insight into the relationship between study skills programs and academic performance indicators (APIs) distinguished by common at-risk factors.

In the first study, a retrospective predictive research design was followed using archival data (2003-2008) from one regional university. Study skills program participation was examined in relation to APIs, controlling for gender and ethnicity. Criterion sampling was used to identify the study skills group ($n$ = 714) and a comparison group ($n$ = 714). Descriptive statistics revealed statistically significant differences in APIs, with women outperforming men and Hispanic women outperforming all other gender and ethnic combinations. A series of regressions indicated statistically significant predictive relationships between the number of sessions completed and APIs, but not program participation and APIs.

In the second study, Learning and Study Strategies Inventory (LASSI) scale performance (e.g., Anxiety, Motivation, Self Testing) was examined in relationship to short-term and long-term APIs of students who completed a study skills workshop series, controlling for gender and ethnicity. Criterion sampling was used to select a subset of students ($n$ = 450). A series of regressions resulted in only one statistically significant

API (i.e., first-semester GPA; $p < .001$). In particular, the Anxiety and Motivation scales were statistically significantly related to GPA ($p < .001$), and resulted in an average increase of .03 and .05, respectively, per unit increase on each scale.

For the third study, by means of a Latent Profile Analysis, three subgroups were identified using study skills workshop series participants' ($n = 450$) LASSI scale performance, with each group possessing correspondingly higher scores in all 10 scales. To determine what relationship, if any, existed between these subgroups and APIs, a series of regressions were conducted. Only one API was identified as statistically significant (first-semester GPA, $p < .001$), thereby calling into question the long-term relationship between LASSI scores and academic performance.

KEYWORDS: Study Skills, Student Success, Gender, Ethnicity, Graduation, Retention, Persistence, Academic Support, At-risk, LASSI

## ACKNOWLEDGEMENTS

I would like to thank my dissertation committee, Drs. Julie Combs, Susan Skidmore, and Peggy Holzweiss for their support, patience, and guidance. Specifically, I would like to thank Susan for her constant handholding during this dissertation (i.e., the Beast) and unfailing optimism concerning statistics, in response to which I would like to echo her daughter and say, "Shopping."

In addition, I want to thank my fellow cohort members—Ed Leadership Cohort 29. Our conversations have been enlightening and often therapeutic. Our time in the academic trenches was well spent.

Lastly, to my coworkers at the SAM Center, thank you for your encouragement and your support, for the office pranks and the moments of laughter, and for the skull and crossbones signs on my office door deterring interruptions. Now, who is starting their doctorate next?

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# CHAPTER I

## INTRODUCTION

Many employers and higher education representatives have argued that students do not have the necessary skills to succeed, much less excel (Bridgeland, Milano, & Rosenblum, 2011; Hart Research Associates, 2015; Hodge & Lear, 2011). Although secondary and higher education institutions receive the blame for much of this *skills gap* (Sparks & Malkus, 2013), it is a harsh reality that 20% (Sparks & Malkus, 2013) to 60% (Bailey, 2009; Bettinger & Long, 2009) of beginning freshmen enroll in at least one developmental course due to their skills deficiency. Further, approximately two thirds of all entering undergraduates are ill-prepared for the rigors of college (Bettinger & Long, 2009; Chen, Wu, & Tasoff, 2010).

This lack of academic preparation burdens institutions in multiple ways. First, the school must pay for the additional remedial courses, the physical facilities to house the courses, and the faculty members to teach the courses, thereby costing postsecondary institutions more than $2 billion per annum (Strong American Schools, 2008). Second, taking time to complete remedial courses places students at risk of either delayed graduation or dropping out of college (Ishitani, 2006; Parsad & Lewis, 2003), which, in turn, causes financial troubles for institutions contending with performance-based funding predicated on academic performance indicators (API) such as retention and graduation rates (Jones, 2013). And third, students who lack necessary study strategies (e.g., critical reading skills, note-taking methods, test-taking strategies) possess lower retention rates and graduation rates (Bailey, 2009; Complete College America, 2012),

which is disturbing given the needs for higher education within the current job market and the call from policy-making institutions for higher graduation rates.

## Educational Significance

The findings from this study may provide information (e.g., effect of study skills workshop on graduation rates) to educational personnel concerning the efficacy of formal study skills program for future decisions regarding budgets and potential funding of student support programs. The findings may further benefit higher education institutions by providing a method that subgroups of students can be identified and targeted with study skills interventions. Moreover, this study's findings may help inform multiple facets of society (e.g., educators, employers, community leaders) about the effect of study skills as an intervention program. Given the potential effect of this study, it is educationally significant as it serves very practical and applied purposes.

## Purpose of the Dissertation

The purpose of this journal-ready dissertation is to provide needed insight into the relationship between study skills programs and academic performance indicators (APIs) distinguished by common at-risk factors (i.e., gender, ethnicity). Given the format of this dissertation, each of the three independent studies has their own purpose. The purpose of the first study is to identify the characteristics of and relationships between study skills program participation and APIs in connection to common at-risk demographic characteristics (i.e., gender, ethnicity). For the second study, the purpose is to identify what relationship, if any, exists between Learning and Study Strategies Inventory (LASSI) scale performance (e.g., Anxiety, Motivation, Self Testing) and APIs of students who completed a study skills workshop series, controlling for at-risk factors. The

purpose of the final study is to identify subgroups within the LASSI scale performance of study skills workshop series participants and to determine what relationship, if any, exists between these subgroups and their respective short- and long-term APIs.

## Research Questions

Given that this study follows a journal-ready dissertation format instead of the traditional format, the research questions are divided among the three individual research studies. As such, the following research questions are divided according to the study in which they are addressed:

### Study 1

1. What are the characteristics of APIs (i.e., first-semester Grade Point Average [GPA], 1-semester persistence, 1-year retention (fall-to-fall), graduation [4-, 5-, 6-year]) for first-semester freshmen (fall, 2003-2008) who participated in a 6-week study skills workshop by demographic characteristics?

2. What is the relationship between APIs of first-time freshmen (fall, 2003-2008) who participated in the study skills workshop series and first-semester freshmen who did not participate in the study skills workshop series, controlling for demographic characteristics?

3. What is the relationship between the number of study skills workshop sessions attended (i.e., one to six) and APIs (i.e., first-semester GPA, 1-semester persistence, 1-year retention (fall-to-fall), graduation [4-, 5-, 6-year]) among first-semester freshmen (fall, 2003-2008), controlling for demographic characteristics?

**Study 2**

What is the relationship between LASSI scale performance (e.g., Anxiety, Motivation, Self Testing) and APIs, both long-term (i.e., degree completion [4-, 5-, 6-year], 1-year retention [fall-to-fall]) and short-term (i.e., first-semester GPA, 1-semester persistence [fall-to-spring]) of first-semester freshmen (fall, 2003-2008) who completed a 6-week study skills workshop series controlling for gender and ethnicity?

**Study 3**

1. What subgroups are identifiable based on LASSI scale performance (e.g., Anxiety, Motivation, Self Testing) for first-semester freshmen (fall, 2003-2008) students who participated in the study skills workshop series?

2. How does first-semester freshmen (fall, 2003-2008) LASSI subgroup membership relate to academic performance indicators, both long-term (i.e., degree completion [4-, 5-, 6-year], 1-year retention [fall-to-fall]) and short-term (i.e., first-semester GPA, 1-semester persistence [fall-to-spring])?

## Conceptual Framework

Two student development theories informed this study's conceptual framework: Tinto's (1997, 2007) theory of student departure/retention and Astin's (1984, 1999) theory of student involvement. Per Astin's (1984, 1999) theory of student involvement, the students who are most involved in and dedicated to both academic and social facets of the higher education ecology are the students who learn the most. According to Astin (1999), successful students spend extensive effort and time on their academic pursuits, dedicate both time and energy to student activities and organizations, and have meaningful relationships with faculty. Whereas Astin's (1984, 1999) theory of student

involvement centers on the reasons that students succeed, Tinto's (1997, 2007) theory of student departure centers upon the reasons that students do not succeed. Specifically, the theory of student departure focuses on students' efforts and involvement in educational processes and its effect on matriculation, and therefore retention rates, at post-secondary institutions (Tinto, 1997, 2007). Tinto (1997) reasoned that student services (e.g., academic support) could stimulate student retention. These theories promote the supposition that programs or courses specifically designed to promote academic support programs (e.g., a study skills workshop series) that improve students' learning and information application ability can increase students' involvement in scholastic endeavors (i.e., engagement), thereby decreasing student departure.

## Definition of Terms

In this section, terms important to the comprehension of the study are defined. Moreover, various academic performance indicators are delineated to explain their use as assessment measures. To facilitate the speed and ease by which the terms and their corresponding definitions can be searched and reviewed, they are presented in alphabetical order (Glaser, 2007; Rule, 2001; Styer, 1972).

### Academic Support

According to the online Integrated Postsecondary Education Data System (IPEDs) Glossary, academic support is a broad category composed of any institutional service or activity that supports the academic missions of public outreach and service, research, and/or instruction (National Center for Education Statistics [NCES], 2015a). Specifically, the term academic support refers to programs and resources "provided to students in the effort to help them accelerate their learning progress, catch up with their

peers, meet learning standards, or generally succeed in school" (Academic support, 2013, para. 1).

### Graduation Rate

The graduation rate is the percent of full-time, first-time, degree/certificate-seeking undergraduate students who complete their programs of study within 150% of the normal time to completion (i.e., 4 to 6 years; NCES, 2015b).

### Retention Rate

Retention rates in postsecondary education are the rates at which students persist at an institution from the previous fall semester to the current fall semester (NCES, 2015c).

### Study Skills

Study skills, also known as study strategies, encompass an assortment of related cognitive techniques that augment the efficiency and effectualness of students' learning (Divine, 1987).

## Review of the Literature

The effect of study skills on academic performance has interested researchers for over 100 years (Moore, Readance, & Rickleman, 1983; Richardson, Robnolt, & Rhodes, 2010). Specifically, study skills have had a positive impact on academic performance and have functioned as a fundamental component of individual success (Astin, 1999; Credé & Kuncel, 2008; Richardson et al., 2010; Tinto, 1997). Several researchers have indicated that the development and the application of study strategies and techniques leads to greater scholastic engagement, thereby enhancing students' performance levels (Kartika, 2007; Proctor, Prevatt, Adams, & Reaser, 2006; Robyak, 1978; Sanoff, 2006;

Urciuoli & Bluestone, 2013). Given the advantages of study skills, their application in academic settings could affect all students, including traditionally at-risk populations. This increase in scholastic ability is of paramount importance to both employers and faculty (Bridgeland et al., 2011; Hart Research Associates, 2015; Hodge & Lear, 2011), to political entities (Obama, 2009), and to the higher education institutions themselves, both socially (Bowman & Bastedo, 2009; Meredith, 2004) and financially (DeBerard, Spielmans, & Julka, 2004; Jones, 2013; Perna, Klein, & McLendon, 2014).

**Need for Academic Support Services**

During the 1990s, the United States possessed the highest college graduation rates in the world (Abel, 2000). Since then, the United States has slipped in the ranks to 16th in the world (Chalian, 2012). According to Pearson (2014), a composite index of multiple international primary and secondary educational rankings, the United States ranks 14th overall in the world concerning student education, 11th in cognitive skills rank, and 20th in overall educational attainment. According to some scholars (Bettinger & Long, 2009; Chen et al., 2010), approximately 66% of all beginning freshmen are ill prepared for the rigors of postsecondary education. Sparks and Malkus (2013) determined that a minimum of 20% of incoming freshmen took at least one developmental course. However, some researchers would claim Sparks and Malkus' (2013) figure was too low, citing developmental course enrollment figures as high as 60% in select higher education institutions (Bailey, 2009; Bettinger & Long, 2009).

This degradation in education, in international standing and in academic performance, has been noticed. Employers and college faculty have argued students do not have the necessary skills to survive, much less thrive, in either the academic

environment or the workforce (Bridgeland et al., 2011; Hart Research Associates, 2015; Hodge & Lear, 2011). Even the President of the United States (Obama, 2009) took notice and issued a decree to the educators in the United States: Return to the top of the higher education graduation rates by 2020.

Given this increased pressure, colleges have begun investigating academic support programs as one of several means to improve student academic performance and to bolster graduation rates. Specifically, academic support encompasses programs and resources "provided to students in the effort to help them accelerate their learning progress, catch up with their peers, meet learning standards, or generally succeed in school" (Academic support, 2013, para. 1). Researchers (Kartika, 2007; Proctor et al., 2006; Robyak, 1978; Sanoff, 2006; Urciuoli & Bluestone, 2013) have shown that instructional and academic support programs created to develop and improve students' study strategies and techniques often lead to an increase in academic performance. Students who do not possess the prerequisite academic skills (e.g., critical reading skills, note-taking methods, test-taking strategies) accounted for lower retention rates and graduation rates (Bailey, 2009; Complete College America, 2012). Given this information, there is a clear need for study skills.

**At-risk Demographics**

*At-risk* is a commonly used term that first appeared in the educational lexicon via Richardson, Casanova, Placier, and Guilfoyle's (1989) study, *School Children At-risk* (Tompkins & Deloney, 1994). Originally used within the medical field of epidemiology (Tompkins & Deloney, 1994), the term now appears irrevocably connected to education in everything from news reports and documentaries (see Stegmier, 2012) to government

documents and academic treatises (see Koball et al., 2011). Although no central definition of the term exists within education (Koball et al., 2011), the term at-risk is synonymous with academic risk. More particularly, the use of at-risk seems to coincide with academic difficulties that often jeopardize a student's ability to perform academically, to be retained, or to graduate (Braxton & Hirschy, 2005; Nora, Barlow, & Crisp, 2005; Reason, 2009a; Tinto, 1975, 1997).

Researchers have investigated student retention and persistence for over 70 years (Braxton, 2000). When these researchers identified causes of student retention, departure, or persistence, they investigated and discussed factors that either challenged or contributed to a student's academic success, thereby placing the student at risk. Moreover, educational entities, secondary and postsecondary alike, pay close attention to students' academic performance and persistence given (a) the ever-present nature of performance-based funding (Jones, 2013; Perna et al., 2014), (b) the connection that students' success plays in the social recognition and ranking of academic institutions (Bowman & Bastedo, 2009; Meredith, 2004), as well as (c) the potential loss of tuition and fees (DeBerard et al., 2004).

Given the importance of student retention, graduation, and academic success to the financial success of higher learning institutions (i.e., performance-based funding), the factors that place students "at-risk" of underperforming academically are of immediate importance to the Academy, necessitating their scrutiny. Given this warranted attention, the academic literature abounds with studies that identify and discuss factors that negatively and/or positively affect students' performance and persistence (Hirschy, Bremer, & Castellano, 2011; Peltier, Laden, & Matranga, 1999; Reason, 2009b). These

factors include psychological and emotional issues (e.g., coping skills; Tinto, 1975, 1997); biological factors (e.g., gender, health; Braxton & Hirschy, 2005; Nora et al., 2005; Reason, 2009a; Tinto, 1975, 1997); economic concerns (e.g., financial aid, SES; Braxton & Hirschy, 2005; Nora et al., 2005; Reason, 2009a; Swail, Redd, & Perna, 2003; Tinto, 1975, 1997); and culture and diversity (Braxton & Hirschy, 2005; Nora et al., 2005; Swail et al., 2003).

Although numerous factors can decrease the likelihood of a student to graduate or to be retained, thereby earning the tag "at-risk," there are two factors of primary interest to this study: (a) gender and (b) ethnicity. Concerning gender, researchers report that men perform worse academically than women (Kim, 2011; Voyer & Voyer, 2014), although the rate at which the men and women differ change in relation to the type of institution in which they were enrolled (see Tables 2.1 and 2.2). In addition to gender, ethnicity and higher education attainment has been a concern in the United States for decades (Kim, 2011; Lucas & Paret, 2005) and much of the literature and data support the statement that students' ethnicity is a significant factor when addressed in connection to academic success (Astin, 1975; Aud, Fox, KewalRamani, 2010; Keller 2001; Kim, 2011). Again, like gender, the rates at which the ethnicities vary depend upon the institution in which they enrolled (see Tables 2.1 and 2.2). Moreover, combining these two groups provides a more telling narrative than when examined in isolation. For example, recent studies indicate that men of African American and Hispanic heritage have lower academic performance than either their female counterparts or White students who are men (Harper, 2012; Strayhorn, 2010).

**Effect of Study Skills**

Researchers (Credé & Kuncel, 2008; Richardson et al., 2010; Tinto, 1997) have concluded that there exists a positive relationship between study skills and academic success, and these skills have been crucial components of student and institutional success. Students who learned, and subsequently used, study skills were more engaged in the classroom and boosted their scholastic performance (Kartika, 2007; Proctor et al., 2006; Robyak, 1978; Sanoff, 2006; Urciuoli & Bluestone, 2013). These findings correspond with Astin's (1984, 1999) theory of involvement, in which he argued individuals who use the greatest amounts of energy, both psychological and emotional, are the ones who learn the most.

Previous study skills researchers (Al-Hilawani & Sartawi, 1997; Kartika, 2007; Urciuoli & Bluestone, 2013) have promoted the usage of study skills both in traditional settings (e.g., classrooms) and in dedicated programs designed to enhance scholastic performance (e.g., formal academic support programs), thereby raising higher education retention rates. Like Astin, Tinto (1997) contended that more situationally involved students (e.g., involved in activities related to their education) had better academic performance than did less involved students. Tinto (1997) argued increasing academic engagement would positively influence students' persistence in higher education; as such, both 2-year and 4-year institutions would profit from increased academic support programs.

According to Nicaise and Gettinger (1995), students who are struggling in school most likely lack adequate study skills, not the ability to excel academically. Supporting Nicaise and Gettinger's (1995) claim are numerous studies in which statistically

significant, positive associations between short-term academic performance indicators (i.e., semester GPA, self-perception) and study skills have been detailed (Al-Hilawani & Sartawi, 1997; Credé & Kuncel, 2008; Kartika, 2007). Although short-term elements have been very common in recent studies, longer-term elements, primarily such as retention rates, have begun to be included as APIs (Al-Hilawani & Sartawi, 1997; Credé & Kuncel, 2008; Kartika, 2007; Urciuoli & Bluestone, 2013). This emphasis on short-term APIs (i.e., GPA, self-perception) appears to have confined study skills assessment to only one dimension of academic performance, contributing scant research in which long-term criteria (i.e., retention rates, graduation rates) were addressed. Despite this new interest in the long-term effects of study skills, only one study has involved an analysis of the relationship between study skills and graduation rates (see Jordan, Parker, Li, & Onwuegbuzie, 2015).

**Learning and Study Strategies Inventory**

Often, researchers use instruments to help determine the effect of study skills on a student population. One of the most extensively used instruments is the LASSI (H & H Publishing, 2011; Hewlett, Boonstra, Bell, & Zumbo, 2000; Prevatt, Reaser, Proctor, & Petscher, 2007). Designed to yield diagnostic or predictive information concerning students' perceptions of their learning abilities and study skills (Weinstein, 1987; Weinstein & Palmer, 2002), the second edition LASSI consists of 80 items, comprising 10 scales each with their own unique characteristics related to learning strategies related to will, self-regulation, and skill components of strategic learning (H & H Publishing, 2005; Weinstein & Palmer, 2002).

Each of the three learning strategies components is composed of three or more LASSI scales (Weinstein & Palmer, 2002). The LASSI scales associated with the Will learning strategy are Anxiety (student's reported levels of worry and concern), Attitude (student's view of college and success), and Motivation (student's academic drive; Weinstein & Palmer, 2002). Concerning Self-regulation, the LASSI scales that compose this learning strategy component include Concentration (student's ability to focus), Self Testing (student's use of strategies to review information), Study Aids (student's use of academic support to aid learning), and Time Management (student's application of time management techniques; Weinstein & Palmer, 2002). The final learning strategy, Skill, is comprised of three LASSI scales: Information Processing (student's use of visual, verbal, and organizational strategies to learn), Selecting Main Ideas (student's ability to distinguish important information from background information), and Test Taking Strategies (student's ability to review material; Weinstein & Palmer, 2002). For more detailed information concerning the LASSI's learning strategies and corresponding scales, please see Table 4.1.

Despite the use of the LASSI by over 2,000 college campuses in the United States (H & H Publishing, 2005), psychometric data are relatively limited (Flowers, Bridges, & Moore, 2012). Both reliability data and test-retest data for the first edition of the LASSI provide evidence of the consistency of the instrument (Flowers, 2003; Flowers et al., 2012) as well as strong test-retest correlations (.72 to .85; Weinstein, 1987). Unfortunately, when investigating the second edition of the LASSI, only coefficient alphas for the individual scales were reported (see Table 4.1; Weinstein & Palmer, 2002), thereby casting some doubt on the validity of the instrument. However, given the

massive use of the instrument, as well as the testing and research conducted on the first edition of the inventory, the LASSI (2nd ed.) was used for this study.

### Summary

As student academic performance has been studied in relation to study skills for over a century (Moore et al., 1983; Richardson et al., 2010), the positive relationship between study skills and academic success is well documented, albeit on short-term scales (e.g., GPA; Credé & Kuncel, 2008; Richardson et al., 2010). However, few studies have delved into the relationship between formal study skills instruction and long-term student success, particularly in the form of graduation and retention rates (Jordan et al., 2015). Given this gap in the literature, making generalizations concerning the long-term effect of study skills requires greater scrutiny, especially in the relationship between study skills and success in connection to traditional at-risk demographics.

## Delimitations and Limitations

This study will focus on one large, regional university in a southeastern state. Mitigating multiple-treatment interference (Onwuegbuzie, 2003) was accomplished by investigating the academic performance of first-semester freshmen only. Additionally, due to changes in policies and methods of calculating GPA at the university, only data from the 2003-2008 academic years (fall-to-fall) were used for this study. The data were archival in nature and will include academic, demographic, and study skills program data for the 2003-2008 academic years. To strengthen this study's design by reducing the effect of confounding variables (Johnson & Christensen, 2010), potential threats to external and internal validity were identified and addressed for each of the three component articles. Each of the articles dealt with the same four concerns: (a) multiple-

treatment interference (external), (b) population validity (external), (c) attrition/mortality (internal), and (d) maturation (internal).

Given the nature of higher education and the pervasive presence of student services and academic aid, academic institutions are inundated with programs designed to aid and enhance students' academic performance. Given this reality, the likelihood of student participation in these programs is great. As such, there is a distinct possibility of multiple-treatment interference, where, through a student's participation in multiple programs, the impact of the individual program is masked (Onwuegbuzie, 2003). To counter this external threat, for each of the three component articles, only first-semester freshmen, whose very nature limits their exposure to additional programs, was used.

The second threat to external validity affects the population validity. Specifically, the criterion-sampling schemes of the three studies, combined with the subsequent subgroups identified from a single university, potentially affect the representativeness of the study (Onwuegbuzie, 2003). However, as stated by Wilkinson and the Task Force on Statistical Inference (TFSI; 1999), the "explicit comparison of sample characteristics with those of a defined population across a wide range of variables" enriches the study's representativeness (p. 595). As each of these studies includes four variables compared across the population, the threat to population validity is mitigated. It is important to note that Wilkinson and TFIS (1999) only discussed convenience sampling in their paper; however, their argument applies to several other non-random sampling schemes, including the criterion-sampling schemes of these studies.

The failure of participants to complete prescribed outcomes is central concern for any study (Johnson & Christensen, 2010). However, attrition, also known as mortality,

threatens internal validity when the participants leave the study, thereby creating inconsistencies between the group(s) being investigated (Onwuegbuzie, 2003). Given the length of time this dissertation's articles span, this threat to internal validity should be ameliorated due to the multiple cohorts that should act as a buffer should one cohort lose too many participants.

The second internal threat is maturation, which concerns the psychological and physiological processes that participants undergo as a consequence of the passage of time (Johnson & Christensen, 2010; Onwuegbuzie, 2003). As Johnson and Christensen (2010) explained, these processes are both long- and short term, including processes such as aging (long-term) and boredom (short-term). As each of the studies in question are retrospective over several years, their design necessitates taking maturation into consideration. Instead of relying on a single variable to indicate program effect, several variables (long-term and short-term) were used to determine the effect of the interventions. Furthermore, a comparison group (i.e., non-participating first-semester freshmen) will act as a delineating point between program participants and non-participants in the first article, thereby decreasing the impact of maturation.

## Organization of the Study

Three journal-ready articles generated new knowledge concerning the effect of study skills participation, and by implication study skills instruction, on the academic success of students by gender and ethnicity. In Study 1, analyses determined the characteristics of academic performance indicators for first-semester freshmen who participated in a study skills workshop series and the relationship between study skills participation and those academic performance indicators, controlling for gender,

ethnicity, and SES. In Study 2, the analyses focused on the relationship between LASSI scale performance and academic performance indicators, controlling for the same two at-risk groups. In the final journal-ready article, Study 3, research questions focused on identifying subgroups within the study skills participants based on LASSI scale measures, and understanding the relation between these subgroups and academic performance indicators.

Five chapters comprise this journal-ready format dissertation. Chapter I contains the dissertation's background, educational significance, purpose statement, research questions, conceptual framework, definition of terms, review of the literature, and overall study delimitations and limitations. Chapters II, III, and IV consist of Study 1, Study 2, and Study 3, respectively. Chapter V contains the discussion of the findings and future research needs.

# CHAPTER II

## EFFECT OF STUDY SKILLS PARTICIPATION ON FRESHMEN ACADEMIC PERFORMANCE

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This dissertation follows the style and format of *Research in the Schools (RITS).*

## Abstract

Study skills program participation was examined in relation to academic performance indicators (APIs), controlling for gender and ethnicity. Following a retrospective predictive research design using archival data (2003-2008) of a formal study skills program, criterion sampling was used to identify the study skills group ($n$ = 714) and a comparison group ($n$ = 714). Descriptive statistics revealed statistically significant differences in APIs, with women outperforming men and Hispanic women outperforming all other gender and ethnic combinations. A series of regressions indicated statistically significant predictive relationships between the number of sessions completed and APIs, but not program participation and APIs.


**Keywords**: Study Skills, Student Success, Gender, Ethnicity, Graduation, Retention, Persistence, Academic Support, At-risk

# EFFECT OF STUDY SKILLS PARTICIPATION ON FRESHMEN ACADEMIC PERFORMANCE

Many employers and higher education representatives have argued that students do not have the necessary skills to succeed, much less excel, in either the classroom or the workforce (Bridgeland, Milano, & Rosenblum, 2011; Hart Research Associates, 2015; Hodge & Lear, 2011). Although secondary and higher education institutions receive the blame for much of this skills gap (Sparks & Malkus, 2013), it is a harsh reality that 20% (Sparks & Malkus, 2013) to 60% (Bailey, 2009; Bettinger & Long, 2009) of beginning freshmen enroll in at least one developmental course. Further, approximately two thirds of all entering undergraduates are ill-prepared for the rigors of college (Bettinger & Long, 2009; Chen et al., 2010).

This lack of academic preparation burdens institutions in multiple ways. First, the school must pay for the additional remedial courses, the physical facilities to house the courses, and the faculty members to teach the courses, thereby costing higher postsecondary institutions more than $2 billion per annum (Strong American Schools, 2008). Additionally, taking time to complete remedial courses places students at risk of either delayed graduation or dropping out of college (Ishitani, 2006; Parsad & Lewis, 2003); which, in turn, causes financial troubles for institutions contending with performance-based funding predicated on academic performance indicators (API) such as retention and graduation rates (Jones, 2013). Moreover, students who lack necessary study strategies (e.g., critical reading skills, note-taking methods, test-taking strategies) possess lower retention rates and graduation rates (Bailey, 2009; Complete College America, 2012), which is disturbing given the needs for higher education within the

current job market and the call from policy-making institutions for higher graduation rates.

## Educational Significance

Few researchers have examined the long-term effect of study skills (e.g., graduation, retention) on student academic success (see Jordan, Parker, Li, & Onwuegbuzie, 2015), instead focusing on short-term effects such as grade point averages (GPAs), instruments, and self-perception (Al-Hilawani & Sartawi, 1997; Credé & Kuncel, 2008; Kartika, 2007). This short-term focus appears to have restricted the scope of academic analysis of study skills and study skills programs to minimal criteria of academic success (e.g., GPA, retention rates; Credé & Kuncel, 2008). As of the writing of this study, only one article focused on graduation rates (i.e., Jordan et al., 2015).

Although the relationship between study skills participation and academic performance indicators (e.g., GPA) is commonly examined in literature, seldom is this relationship viewed in the context of the diverse subgroups within the population (e.g., gender, ethnicity). In most research studies, the evaluation and assessment of study skills programs and instruction has been limited to either APIs (e.g., GPA, retention rates) or students' perceptions (Credé & Kuncel, 2008), which limits the scope in which study skills and their impact on academics are viewed.

This study will help fill the gap in the research literature by examining the effect of study skills participation on first-semester freshmen undergraduate students by employing APIs to determine academic success in both the short term (i.e., GPA, persistence) and in the long term (i.e., retention, graduation). By analyzing the impact of a study skills workshop series on multiple levels of graduation (i.e., 4-, 5-, 6-year), this

study will further the critical examination of the effect of a study skills workshop series on graduation rates of first-semester freshmen undergraduate students. To address the lack of diversity within most study skills research, the relationship between study skills participation and academic performance was examined by ethnicity and gender—a rarity in study skills literature—thereby furthering the literature on the topic of study skills.

It is hoped that the findings from this study will provide information (e.g., long-term effect of study skills, on graduation rates, and on specific demographics) to educational personnel concerning the efficacy of academic support programs and academic skills training for future decisions concerning budgets and potential funding of student support programs. This study might benefit higher education institutions by providing a method to identify subgroups of students who will benefit from study skills interventions. Moreover, it is hoped that the study's findings will help inform multiple facets of society (e.g., educators, employers, community leaders) about the effect of study skills as an intervention program. As such, this study's educational significance serves very practical and applied purposes.

## Purpose and Research Questions

The purpose of this study is to identify the characteristics of and relationships between study skills program participation and APIs in connection to common at-risk demographic characteristics (i.e., gender, ethnicity). To address this purpose, the following research questions were addressed in this study:

1. What are the characteristics of APIs (i.e., Grade Point Average [first-semester GPA], 1-semester persistence, 1-year retention (fall-to-fall), degree completion [4-, 5-, 6-

year]) for first-semester freshmen (fall, 2003-2008) who participated in a 6-week study skills workshop by at-risk demographic characteristics?

2. What is the relationship between APIs of first-time freshmen (fall, 2003-2008) who participated in the study skills workshop series and first-semester freshmen who did not participate in the study skills workshop series, controlling for at-risk demographic characteristics?

3. What is the relationship between the number of study skills workshop sessions attended (i.e., one to six) and APIs (i.e., first-semester GPA, 1-semester persistence, 1-year retention (fall-to-fall), degree completion [4-, 5-, 6-year]) among first-semester freshmen (fall, 2003-2008), controlling for at-risk demographic characteristics?

## Conceptual Framework

Two student development theories were included in the conceptual framework: Tinto's (1997, 2007) theory of student departure/retention and Astin's (1984, 1999) theory of student involvement. Per Astin's (1984, 1999) theory of student involvement, the students who are most involved in and dedicated to both academic and social facets of the higher education ecology are the students who learn the most. According to Astin (1999), successful students spend extensive effort and time on their academic pursuits, dedicate both time and energy to student activities and organizations, and have meaningful relationships with faculty. Whereas Astin's (1984, 1999) theory of student involvement centers on the reasons students succeed, Tinto's (1997, 2007) theory of student departure centers upon the reasons students do not succeed. Specifically, the theory of student departure focuses on students' efforts and involvement in educational processes and its effect on matriculation, and therefore retention rates, at postsecondary

institutions (Tinto, 1997, 2007). Moreover, Tinto (1997) reasoned that student services (e.g., academic support) could stimulate student retention. These theories promote the supposition that programs or courses specifically designed to support academic support (e.g., a study skills workshop series) that improve students' learning and information application ability can increase students' involvement in scholastic endeavors (i.e., engagement), thereby decreasing student departure.

## Review of the Related Literature

The effect of study skills on academic performance has interested researchers for over 100 years (Moore, Readance, & Rickleman, 1983; Richardson, Robnolt, & Rhodes, 2010). Specifically, study skills have had a positive impact on academic performance and have functioned as a fundamental component of individual success (Astin, 1999; Credé & Kuncel, 2008; Richardson et al., 2010; Tinto, 1997). Several researchers have indicated that the development and the application of study strategies and techniques leads to greater scholastic engagement, thereby enhancing students' performance levels (Kartika, 2007; Proctor, Prevatt, Adams, & Reaser, 2006; Robyak, 1978; Sanoff, 2006; Urciuoli & Bluestone, 2013). Given the advantage of study skills, their application in academic settings could affect all students, including traditionally at-risk populations. As such, this increase in scholastic ability is of paramount importance to both employers and faculty (Bridgeland et al., 2011; Hart Research Associates, 2015; Hodge & Lear, 2011), to political entities (Obama, 2009), and to the higher education institutions themselves, both socially (Bowman & Bastedo, 2009; Meredith, 2004) and financially (DeBerard, Spielmans, & Julka, 2004; Jones, 2013; Perna, Klein, & McLendon, 2014).

**Need for Academic Support Services**

During the 1990s, the United States possessed the highest college graduation rates in the world (Abel, 2000). However, since then, the United States has slipped in the ranks to 16th in the world (Chalian, 2012). Moreover, according to Pearson (2014), a composite index of multiple international primary and secondary educational rankings, the United States ranks 14th overall in the world concerning student education, 11th in cognitive skills rank, and 20th in overall educational attainment. According to some scholars (Bettinger & Long, 2009; Chen et al., 2010), approximately 66% of all beginning freshmen are ill prepared for the rigors of postsecondary education. As such, it is not surprising Sparks and Malkus (2013) determined that a minimum of 20% of incoming freshmen took at least one developmental course. However, some researchers would claim Sparks and Malkus' (2013) figure was too low, citing developmental course enrollment figures as high as 60% in select higher education institutions (Bailey, 2009; Bettinger & Long, 2009).

This degradation in education, in international standing and in academic performance, has been noticed. Employers and college faculty have argued students do not have the necessary skills to survive, much less thrive, in either the academic environment or the workforce (Bridgeland et al., 2011; Hart Research Associates, 2015; Hodge & Lear, 2011). Even the President of the United States (Obama, 2009) took notice and issued a decree to the educators in the United States: Return to the top of the higher education graduation rates by 2020.

Given this increased pressure, colleges have begun investigating academic support programs as one of several means to improve student academic performance and

to bolster graduation rates. Specifically, academic support encompasses programs and resources "provided to students in the effort to help them accelerate their learning progress, catch up with their peers, meet learning standards, or generally succeed in school" (Academic support, 2013, para. 1). Researchers (Kartika, 2007; Proctor et al., 2006; Robyak, 1978; Sanoff, 2006; Urciuoli & Bluestone, 2013) have shown that instructional and academic support programs created to develop and improve students' study strategies and techniques often lead to an increase in academic performance. Students who do not possess the prerequisite academic skills (e.g., critical reading skills, note-taking methods, test-taking strategies) accounted for lower retention rates and graduation rates (Bailey, 2009; Complete College America, 2012). Given this information, there is a clear need for study skills.

**At-risk Demographics**

*At-risk* is a commonly used term that first appeared in the educational lexicon via Richardson, Casanova, Placier, and Guilfoyle's (1989) study, *School Children At-risk* (Tompkins & Deloney, 1994). Originally used within the medical field of epidemiology (Tompkins & Deloney, 1994), the term now appears irrevocably connected to education in everything from news reports and documentaries (see Stegmier, 2012) to government documents and academic treatises (see Koball et al., 2011). Although no central definition of the term exists within education (Koball et al., 2011), the term at-risk seems synonymous with academic risk. More particularly, the use of at-risk seems to coincide with academic difficulties that often jeopardize a student's ability to perform academically, to be retained, or to graduate (Braxton & Hirschy, 2005; Nora, Barlow, & Crisp, 2005; Reason, 2009a; Tinto, 1975, 1997).

Researchers have investigated student retention and persistence for over 70 years (Braxton, 2000). As such, when these researchers identified causes of student retention, departure, or persistence, they investigated and discussed factors that, by their very nature, challenged a student's academic success, thereby placing the student at risk. Moreover, educational entities, secondary and postsecondary alike, pay close attention to students' academic performance and persistence given (a) the ever-present nature of performance-based funding (Jones, 2013; Perna et al., 2014), (b) the connection that students' success plays in the social recognition and ranking of academic institutions (Bowman & Bastedo, 2009; Meredith, 2004), as well as (c) the potential loss of tuition and fees (DeBerard et al., 2004). Given the importance of student retention, graduation, and academic success to the financial success of higher learning institutions (i.e., performance-based funding), the factors that place students "at-risk" of underperforming academically are of immediate importance to the Academy, and, as such, are often scrutinized. Given this scrutiny, the academic literature abounds with studies that identify and discuss factors that negatively and/or positively affect students' performance and persistence (Hirschy, Bremer, & Castellano, 2011; Peltier, Laden, & Matranga, 1999; Reason, 2009b). These factors include psychological and emotional issues (e.g., coping skills; Tinto, 1975, 1997); biological factors (e.g., gender, health; Braxton & Hirschy, 2005; Nora et al., 2005; Reason, 2009a; Tinto, 1975, 1997); economic concerns (e.g., financial aid, SES; Braxton & Hirschy, 2005; Nora et al., 2005; Reason, 2009a; Swail, Redd, & Perna, 2003; Tinto, 1975, 1997); and culture and diversity (Braxton & Hirschy, 2005; Nora et al., 2005; Swail et al., 2003).

Although numerous factors can decrease the likelihood of a student to graduate or to be retained, thereby earning the tag "at-risk," there are two factors of primary interest to this study: (a) gender and (b) ethnicity. Concerning gender, several sources report that men perform worse academically than women (Kim, 2011; Voyer & Voyer, 2014), although the rate at which the men and women differ change in relation to the type of institution in which they were enrolled (see Tables 2.1 and 2.2). Additionally, ethnicity and higher education attainment has been a concern in the United States for decades (Kim, 2011; Lucas & Paret, 2005) and much of the literature and data support the statement that students' ethnicity is a significant factor when addressed in connection to academic success (Astin, 1975; Aud, Fox, KewalRamani, 2010; Keller 2001; Kim, 2011). Again, like gender, the rates at which the ethnicities vary depend upon the institution in which they enrolled (see Tables 2.1 and 2.2). When researchers account for both gender and ethnicity, they provide a more complete representation of the students in higher education. For example, Harper (2012) and Strayhorn (2010) concur that students who are Hispanic and African American men perform lower academically than Hispanic and African American students who are women, respectively.

**Effect of Study Skills**

Researchers (Credé & Kuncel, 2008; Richardson et al., 2010; Tinto, 1997) have concluded that there exists a positive relationship between study skills and academic success, and these skills have been crucial components of student and institutional success. Furthermore, students who learned, and subsequently used, study skills were more engaged in the classroom, in turn, boosted their scholastic performance (Kartika, 2007; Proctor et al., 2006; Robyak, 1978; Sanoff, 2006; Urciuoli & Bluestone, 2013).

These findings correspond with Astin's (1984, 1999) theory of involvement, in which he argued individuals who use the greatest amounts of energy, both psychological and emotional, are the ones who learn the most.

Furthermore, previous study skills researchers (Al-Hilawani & Sartawi, 1997; Kartika, 2007; Urciuoli & Bluestone, 2013) have promoted the usage of study skills both in traditional settings (e.g., classrooms) and in dedicated programs designed to enhance scholastic performance, thereby raising higher education retention rates. Like Astin, Tinto (1997) contended that more situationally involved students had better academic performance than did less involved students. Moreover, Tinto (1997) contended that increasing academic engagement would positively influence student persistence in higher education; as such, both 2-year and 4-year institutions would profit from increased academic support programs.

According to Nicaise and Gettinger (1995), students who are struggling in school most likely lack adequate study skills, not the ability to excel academically. Supporting Nicaise and Gettinger's (1995) claim are numerous studies in which statistically significant, positive associations between short-term APIs (i.e., semester GPA and self-perception) and study skills have been detailed (Al-Hilawani & Sartawi, 1997; Credé & Kuncel, 2008; Kartika, 2007). Although short-term elements have been very common in recent studies, longer-term elements, such as retention rates, have begun to be included in several recent articles as APIs (Al-Hilawani & Sartawi, 1997; Credé & Kuncel, 2008; Kartika, 2007; Urciuoli & Bluestone, 2013). This emphasis on short-term APIs (i.e., GPA, self-perception) appears to have confined study skills assessment to only one dimension of academic performance, contributing scant research in which long-term

criteria (i.e., retention rates, graduation rates) were addressed. Despite this new interest in the long-term effects of study skills, to date, only one study, as identified by this study's author, has involved an analysis of the relationship between study skills and graduation rates (see Jordan et al., 2015).

### Summary

As student academic performance has been studied in relation to study skills for over a century (Moore et al., 1983; Richardson et al., 2010), the positive relationship between study skills and academic success is well documented, albeit on the short scale (Credé & Kuncel, 2008; Richardson et al., 2010). However, few studies have delved into relationship between formal study skills instruction and long-term student success, particularly in the form of graduation and retention rates (Jordan et al., 2015). Given this gap in the literature, making generalizations concerning the long-term effect of study skills requires greater scrutiny, especially in the relationship between study skills and success in connection to traditional at-risk demographics.

## Method

Johnson's (2001) two-dimensional typology informed this study's research design. Given the data were collected for a span of six years (i.e., time dimension), the main purpose of the study was to provide an accurate description of the characteristics of first-semester freshmen study skill participants and then to identify what relationship, if any, existed between study skills participation and APIs (i.e., research objective). Therefore, this study followed a retrospective predictive research design (Johnson, 2001; Johnson & Christensen, 2010).

**Data Sources**

Participant data were gathered from archival sources. Participants were first-semester freshmen, undergraduate students from a large, public university in a southeastern state. Moreover, participants were only from the Fall 2003 semester (the study skills program inception) through the Fall 2008 semester (after which the university altered its GPA calculation method). During the fall semester of 2003-2008, the university had a combined undergraduate population of 79,280, with an average of approximately 13,213 undergraduate students per semester. Of this total, there was a combined 12,766 first-semester freshmen during the fall semesters of 2003-2008, representing the population of the study. First-semester freshmen formed the target population because, being new to the university setting, they had less opportunity to participate in additional interventions that might influence the results of this study, thereby reducing multiple-treatment interference (Onwuegbuzie, 2003). See Table 2.3 for more details concerning the university populations.

During 2003-2008, the 6-week study skills workshop was conducted, consisting of six, 50-minute classes covering time management skills, critical reading skills, stress management techniques, test-taking strategies, note-taking strategies, and methods to deal with procrastination. A total of 2,284 students, representing all undergraduate classifications, participated in the program (see Table 2.3). Data selected for this study were based on a criterion-sampling scheme (Creswell, 2008). The criteria for the study were (a) first-semester freshman status; (b) self-selected participation in the 6-week, formal study skills program; and (c) enrollment during the Fall 2003-2008 semesters. Additionally, to establish a comparison group, a two-stage sampling were performed.

First, students were identified based on the following criteria (i.e., criterion sampling): (a) first-semester freshman status; (b) non-participation in the 6-week, formal study skills program; and (c) enrollment during the Fall 2003-2008 semesters. From this group, a random proportionate stratified sampling approach was conducted based on gender and ethnicity, thereby creating a comparison group ($n$ = 714) against which the intervention group was compared ($n$ = 714; Johnson & Christensen, 2010).

**Measures**

APIs are commonly used in education to determine academic success (Banta & Palomba, 2015), which, for this study, encompass four measures: graduation, 1-year retention, 1-semester persistence, and first-semester GPA. All information concerning these measures were gathered from the university where the study skills workshops were conducted. The first variable, graduation, is a long-term API defined as the percent of full-time, first-time, degree-/certificate-seeking undergraduate students who complete their programs of study within 150% of the normal time to completion (i.e., 4-, 5-, 6-years; National Center for Education Statistics [NCES], 2015a). Contrary to this definition, graduation was a dichotomous variable indicating whether students graduated or not (i.e., yes or no), thereby making the student the unit of analysis instead of the institution. Retention is another long-term API, often defined in postsecondary education as the rate at which students persist at an institution from the previous fall semester to the current fall semester (NCES, 2015b). For the purpose of this study, only whether the student was retained or not (i.e., fall-to-fall; dichotomous value) was relevant.

Short-term APIs (i.e., first-semester GPA, 1-semester persistence) were also crucial for this study. GPA is a commonly explored variable in education (Kuncel,

Credé, & Thomas, 2005) and it is the central variable in several study skills studies (e.g., Credé & Kuncel, 2008; Hassanbeigi et al., 2011; Pepe, 2012); therefore, first-semester institutional GPA will serve as a point against which this study's results can be compared. Moreover, as this study's sample population consisted of first-semester freshmen, their coursework was suitably similar (i.e., majority were freshmen core courses), thereby allaying potential disparities between course grading policies and the possibly effect on GPA.

In contrast, the term persistence is anything but clear as it is often used interchangeably with retention (Hagedorn, 2006) in literature. According to the NCES, persistence is a "student measure" akin to retention being an "institutional measure" (Hagedorn, 2006, p. 6). Although the term persistence has been used in reference to varying spans of time, it always seems to pertain to whether a student remains in school or not. Given the mutable time-spans found within the literature, for this study, persistence will represent whether the participants returned to school the following semester (i.e., fall-to-spring) or not, thereby supporting a dichotomous variable (i.e., yes or no).

There are multiple factors that affect students earning the title at-risk (Lopez-Wagner, Carollo, & Shindledecker, n.d.), including weak academic preparation (Astin, Korn, & Green, 1987; Hirschy et al., 2011) as well as the number of required remedial/developmental courses (Bremer et al., 2013). However, for this study, the two at-risk factors of interest are demographic characteristics (Hirschy et al., 2011; Peltier et al., 1999): (a) gender and (b) ethnicity (i.e., African American, Hispanic, White). These characteristics are considered at-risk factors because students with certain characteristics

perform more poorly than other groups. For example, the academic performance (i.e., graduation, retention rate) of male African American students is lower than any other combination of gender and ethnicity (NCES, 2014a, 2014b).

**Analysis**

In addressing the first research question, descriptive statistics were calculated for the intervention group to assess academic performance (i.e., graduation, retention, persistence, GPA) by demographic at-risk characteristics in isolation. For the second research question, two types of statistical regressions were conducted. For the dependent variable, GPA, a traditional regression was used to determine the relationship between the degree of program participation (the number of study skills workshops attended) and GPA. Given that the other dependent variables (i.e., 1-semester persistence, 1-year retention, and graduation) in the second research question are dichotomous in nature (Peng, Lee, & Ingersoll, 2010), binary logistic regressions were performed, thereby identifying the relationships between the number of study skills workshop sessions attended and APIs, controlling for at-risk demographic characteristics. For the third research question, two types of regressions were conducted to identify the relationship between APIs (traditional regression for GPA and binary logistic regressions for the rest) of first-time freshmen (fall, 2003-2008) who participated in the study skills workshop series and first-semester freshmen who did not participate in the study skills workshop series by at-risk demographic characteristics.

# Results

## APIs by Participants

The study skills participants ($n$ = 714) had an average first-semester GPA of 2.66 with a standard deviation of .88. After applying Bonferroni adjustments ($p < .02$), pairwise comparisons between each gender within each ethnicity indicated that women achieved statistically significantly higher semester GPAs than their men counterparts did across all ethnic groups. See Table 2.4 for more details.

Assuming that the event probability (e.g., graduated or not) is the same for all groups of students and whether the event occurred or not was independent of that of any other student, $z$ tests for two proportions were used to compare the proportion of men and women within each ethnic group. Within ethnic groups, there were no statistically significant differences ($p < .05$) between men and women regarding 1-semester persistence or 1-year retention. Although African American students had the greatest rate of persistence, they had the lowest 1-year retention—less than a third of the other two ethnic groups. Within ethnic groups, women demonstrated higher academic performance than men did across the spectrum. Hispanic women graduated at a statistically significantly higher rate than Hispanic men did during the 4-, 5-, and 6-year increments. Moreover, Hispanic women exhibited the highest graduation rates of all gender and ethnicity combinations. African American women outperformed their male counterparts during the 4- and 5-year graduation periods. Although White women possessed higher 4-, 5-, and 6-year graduation rates than White men, these differences were not statistically significant. Even when the differences within ethnic groups were not statistically significant by gender, women still academically outperformed their male counterparts in

all areas with the exception of African American men and 1-year retention (see Table 2.4).

**APIs by Study Skills Participation**

A regression model was used to identify the relationship between the study skills participation (i.e., did or did not) and GPA among first-semester freshmen, controlling for demographic characteristics. Regression assumptions were first conducted to determine the tenability of this analysis. Although the Durbin-Watson test indicated a slight positive autocorrelation (0.97), thereby calling into question the independence of the data, the other statistical assumptions necessary for regressions were met (i.e., normality [visual inspection of the Q-Q plots], homoscedasticity [scatterplot showed no relationship], multicollinearity [all VIFs ~1.00]). The regression model was found to be statistically significant ($F[4, 1423] = 24.66$, $p < .001$) and accounted for approximately 7% of the variance in semester GPA ($R^2 = .07$, $R^2_{adj} = .06$). Although the model was statistically significant, study skills participation was not a statistically significant contributor in understanding students' GPA.

Logistic regressions were used to identify the relationship between students who participated in the study skills workshop program and APIs (i.e., 1-semester persistence, 1-year retention, graduation) among first-semester freshmen, controlling for demographic characteristics. First, logistic regression assumptions were tested. Through the use of a Box-Tidwell procedures, the data were found to be linear. Additionally, the data were independent (Durbin-Watsons = 1.89 to 2.02) and did not exhibit multicollinearity (all VIFs = 1 to 1.07).

The full model was a statistically significant predictor of 1-semester persistence, $\chi^2$ (4) = 13.51, $p$ = .01, $N$ = 1428. However, the Nagelkerke's $R^2$ of .02 demonstrated that the predictors only slightly improved the models ability to predict persistence. Although the model was statistically significant, study skills participation was not a statistically significant contributor in understanding students' 1-semester persistence (see Table 2.5 for more information).

The full model was a statistically significant predictor of 1-year retention ($\chi^2$ [4] = 12.28, $p$ = .02, $N$ = 1428). The Nagelkerke's $R^2$ (.01) indicated the full model was only slightly better able to predict retention. Although the model was statistically significant, study skills participation was not a statistically significant contributor in understanding students' 1-year retention (see Table 2.5 for more information).

Concerning graduation, the full models were statistically significant predictors of 4-year ($\chi^2$ [4] = 16.70, $p$ < .01, $N$ = 1428), 5-year ($\chi^2$ [4] = 19.51, $p$ < .01, $N$ = 1428), and 6-year graduation ($\chi^2$ [4] = 16.17, $p$ < .01, $N$ = 1428). Similar to 1-semester persistence and 1-year retention, the Nagelkerke's $R^2$ for each graduation variable was small (.02 for each variable) and, as such, only slightly improved the ability to predict persistence. Although the model was statistically significant, study skills participation was not a statistically significant contributor in understanding students' academic performance (see Table 2.5 for more information).

**APIs by Number of Study Skills Sessions**

A regression model was used to identify the relationship between the number of study skills workshop sessions attended and GPA among first-semester freshmen, controlling for at-risk demographic characteristics. Regression assumptions were tested.

Although visual inspection of the Q-Q plots indicated the data were somewhat non-normal, the other regression assumptions were met. Data were found to be homoscedastic (scatterplot showed no relationship), independent (Durbin-Watson = 1.87), and did not exhibit multicollinearity (all VIFs = ~1.00). The regression model was found to be statistically significant ($F[4, 709] = 22.71$, $p < .001$) and accounted for approximately 11% of the variance in semester GPA ($R^2 = .11$, $R^2_{adj} = .11$). Given these results, the number of sessions attended, even when accounting for gender and ethnicity, was a statistically significant predictor of students' GPA. Indeed, for every session attended, on average, a .10 increase GPA resulted.

Logistic regressions were used to identify the relationship between the number of study skills workshop sessions attended and APIs (i.e., 1-semester persistence, 1-year retention, graduation) among first-semester freshmen, controlling for at-risk demographic characteristics. Assumptions for the logistic regressions were tested and the data were independent (Durbin-Watson = 2.03) and did not exhibit multicollinearity (all VIFs = ~1.00). Through the use of Box-Tidwell procedures the data were found to be linear, with the exception of 5-year graduation ($p = .03$). Although the linearity of this variable was violated, similar variables (i.e., 4-year, 6-year graduation) indicated linearity. As such, logistic regressions were deemed applicable.

The full model was a statistically significant predictor of 1-semester persistence, $\chi^2 (4) = 11.27$, $p = .02$, $N = 714$. However, the Nagelkerke's $R^2$ of .03 indicated that the model's ability to predict persistence was minimally useful. The odds ratio indicated that every session increase in study skills participation multiplied the odds of persisting by 1.14 (see Table 2.6 for more information).

The full model was a statistically significant predictor of 1-year retention, $\chi^2$ (4) = 13.25, $p$ = .01, $N$ = 714. The Nagelkerke's $R^2$ (.03) indicated that even with the inclusion of predictors, the model was only slightly better able to predict retention. The odds ratio indicated that every session increase in study skills participation multiplied the odds of being retained by 1.13. Table 2.6 has detailed information.

Concerning graduation, the full models were statistically significant predictors for 4-year ($\chi^2$ [4] = 11.28, $p$ = .02, $N$ = 714), 5-year ($\chi^2$ [4] = 25.08, $p$ < .001, $N$ = 714), and 6-year graduation ($\chi^2$ [4] = 25.08, $p$ < .001, $N$ = 714). However, like 1-semester persistence and 1-year retention, the Nagelkerke's $R^2$ for each graduation variable was small (4-year = .03, 5-year = .05, 6-year = .04) and, as such, only slightly improved the ability to predict graduation. The odds ratios for graduation indicate that every session increase in study skills participation multiplies the odds of graduating by 1.12 and 1.17, 4-year and 5-year graduation respectively. However, concerning 6-year graduation, the odds ratios indicated that every session increase in study skills participation multiplied the odds of not graduating by 1.35 (see Table 2.6 for more information).

**Limitations/Delimitations**

This study focused on one large, regional university in a southeastern state. Due to changes in policies and methods of calculating GPA at the university, only data from the 2003-2008 academic years (fall-to-fall) were used for this study. The data were archival and included academic, demographic, and study skills program data for the 2003-2008 academic years.

To strengthen this study's design, potential threats to external and internal validity were identified and addressed. Given the nature of higher education and the pervasive

presence of student services and academic aid, colleges and universities offer a veritable cornucopia of intervention programs to boost academic skills, to minimize student attrition, and to enhance student collegial awareness. As such, the potential for multiple-treatment interference, which occurs when research participants engage in multiple interventions thereby masking program effects (Onwuegbuzie, 2003), is a concern for researchers in higher education. For this study, countering the external validity threat of multiple-treatment interference is crucial. As such, only first-semester freshmen, who by their very nature have had only limited experience in a college setting, therefore limited exposure to additional interventions, were used for the study.

However, the use of criterion sampling means that only a small portion of a single university is used for the study potentially threatening its population validity (Onwuegbuzie, 2003). Nevertheless, if the sample's multiple variables are explicitly compared across the population, then the representativeness of the study is enhanced (Wilkinson & Task Force on Statistical Inference [TFSI], 1999). It is important to note that although Wilkinson and TFSI (1999) specifically referenced convenience sampling in their paper, but their argument equally applies to any a criterion-sampling scheme.

In addition, maturation and attrition were internal threats to validity were acknowledged. Maturation refers to the processes, both physical and mental, that participants experience due to the passage of time (Johnson & Christensen, 2010; Onwuegbuzie, 2003), which include long-term processes such as aging, variable-term processes such as learning, and short-term processes such as boredom (Johnson & Christensen, 2010). Given the study's retrospective design consisting of multiple academic years, maturation is an internal validity threat that must be assuaged. As such,

instead of relying on a single variable to indicate program effect, several variables, both long- and short-term, were used to determine intervention effect. Moreover, this study employs a comparison group consisting of first-semester freshmen that functioned as a comparison point for the measurement of intervention effects.

Within many studies, the failure of students to complete outcomes is concerning (Johnson & Christensen, 2010). However, this attrition, also known as mortality, only constitutes a threat to internal validity when participants who leave the study create inconsistencies between the group, or groups, being studied (Onwuegbuzie, 2003). The long-term nature of the study allayed this internal validity threat because the multiple cohorts of both the intervention group and comparison group acted as a buffer against one cohort losing too many participants.

## Discussion

According to Sparks and Malkus (2013), a skills gap exists between what students know and what they need to know to successfully navigate the rigors of higher education. Moreover, several studies have indicated that not only do students not have the skills necessary for college, but that this lack of skills has shifted to the workforce as well (Bridgeland et al., 2011; Hart Research Associates, 2015; Hodge & Lear, 2011). According to Tinto (1997, 2007) and Astin (1984, 1999), students who are more actively involved in school are more likely to not only remain in school but to excel academically. Tinto (1997) also stated that programs designed to enhance students' academics are beneficial. As such, researchers have advocated study skills instruction to promote academic performance (Al-Hilawani & Sartawi, 1997; Kartika, 2007; Urciuoli & Bluestone, 2013), thereby promoting student retention and graduation.

As a whole, women outperformed men across the ethnic groups at all levels of academic performance. This finding corroborated the extent literature (e.g., Kim, 2011; Voyer & Voyer, 2014), and prompts the follow up questions: What actions can be taken to enhance men's academic performance in general and do study skills programs provide a greater benefit to men or women? In regards to ethnicity, White men outperformed Hispanic and African American men, and White women outperformed African American women, all of which is in line with current research (Harper, 2012, Strayhorn, 2010). What differs from the literature is that Hispanic women outperformed all other gender and ethnic combinations in all areas, with the exception of African American women and 1-semester persistence, thereby warranting future research.

Although no statistically significant differences existed for any of the APIs in regards to study skills participation, this finding does not negate the potential effect of study skills instruction. Given that the study skills participation treatment variable was dichotomous (i.e., yes or no), all students who participated in the study skills workshop series were included for the purpose of analysis. As such, students who completed anywhere from one to six of the sessions were included in the variable. Those students who failed to complete the study skills workshops (six of six) may lack the necessary motivation, desire, drive, or grit to perform well academically. As such, the participant variable may not be as representative of the program and its potential effect.

To balance this potential lack of representation, the relationship between the number of study skills sessions completed and APIs were investigated. For all APIs, completing more study skills sessions, thereby indicating greater engagement, resulted in statistically significant increases. Regarding GPA, each additional session attended

resulted in a .10 increase in GPA. Concerning the rest of the APIs, in general, for every additional study skills session completed the odds of improved academic performance is increased by 1.12 to 1.17, except for 6-year graduation that shows students who take more classes actually decrease their likelihood of graduating. The 6-year graduation outcome could rightly indicate that students who took study skills courses had greater odds of graduating before the 6-year mark, and the more study skills sessions they attended, the more likely it is they graduated before their sixth year, especially considering the data for 4- and 5-year graduation. Additionally, students may face the lack of financial aid the longer they stay in school, thereby causing higher attrition rates as more time passed (Bettinger, 2004; Scott-Clayton, 2011), which could be a possible explanation of the decreasing odds ratio for 6-year graduation. This statistic also did not take into account students who may have transferred to other educational institutions, left college for the workforce, or left the university for other reasons (e.g., death, military service). However, given the statistical significance of these findings, but the lack of statistical significance inherent in program participation in relation to a comparison group, researchers should narrow the scope of investigation to those students who completed study skills, as opposed to mere participation, to determine the academic effect of study skills programs and instruction. Also, replicating this study with more contemporary data would improve the generalizability of the study's findings.

In regards to educational significance, study skills participation had a positive effect on most APIs. As such, administrators and educators could increase their awareness of study skills programs, and study skills in general, as these APIs (e.g., 1-year retention, 4-year graduation) serve dual function as academic success markers and key

indicators for performance-based funding (Jones, 2013). At the very least, participating in study skills does not hurt student academic performance, and, given this study's results, at its best, participation may actually improve academic performance.

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Table 2.1

*2012-2013 Nation-wide 1-year Retention Rates of First-time Degree-seeking Undergraduates at Degree-granting Postsecondary Institutions by At-risk Factor*

| At-risk Factor | | 1-year Retention Rate | | | |
|---|---|---|---|---|---|
| | | Overall | Public | Private, Non-profit | Private, For-profit |
| Overall | | 72.9% | 71.4% | 80.3% | 62.8% |
| Gender | | | | | |
| | Men | 56.5% | 54.6% | 62.3% | 35.7% |
| | Women | 61.9% | 60.3% | 67.7% | 28.3% |
| Ethnicity | | | | | |
| | White | 62.9% | 60.7% | 65.7% | 39.9% |
| | African American | 40.8% | 40.3% | 44.6% | 22.4% |
| | Hispanic | 52.5% | 50.7% | 55.7% | 35.0% |

*Note*. Data gathered from the National Center for Education Statistics (NCES, 2014b).

Table 2.2

*Nation-wide 6-year Graduation Rates of First-time Degree-seeking Undergraduates at Degree-granting Postsecondary Institutions by At-risk Factor for 2007 Starting Cohort*

| At-risk Factor | | 6-year Graduation Rate | | | |
|---|---|---|---|---|---|
| | | Overall | Public | Private, Non-profit | Private, For-profit |
| Overall | | 59.4% | 57.7% | 63.1% | 31.9% |
| Gender | | | | | |
| | Men | 56.5% | 54.6% | 62.3% | 35.7% |
| | Women | 61.9% | 60.3% | 67.7% | 28.3% |
| Ethnicity | | | | | |
| | White | 62.9% | 60.7% | 65.7% | 39.9% |
| | African American | 40.8% | 40.3% | 44.6% | 22.4% |
| | Hispanic | 52.5% | 50.7% | 55.7% | 35.0% |

*Note*. Data gathered from the National Center for Education Statistics (NCES, 2014a).

Table 2.3

*Totals by Population for the 2003-2008 Fall Semesters at the Study's Institution*

| Population | Fall 2003 | Fall 2004 | Fall 2005 | Fall 2006 | Fall 2007 | Fall 2008 | Total |
|---|---|---|---|---|---|---|---|
| Overall Undergrad Pop | 11,508 | 12,300 | 13,197 | 13,789 | 14,167 | 14,319 | 79,280 |
| Overall Study Skills Participants | 516 | 389 | 388 | 286 | 367 | 338 | 2,284 |
| First Semester, First Time Students | 1,829 | 2,144 | 2,209 | 2,220 | 2,240 | 2,124 | 12,766 |
| First Semester, First Time Students in Study Skills | 254 | 150 | 130 | 58 | 84 | 54 | 730 |

Table 2.4

*Descriptive Statistics of Academic Performance Indicators by Ethnicity and Gender*

| API | Statistic | African American ($n$ = 161) | | Hispanic ($n$ = 127) | | White ($n$ = 426) | |
|---|---|---|---|---|---|---|---|
| | | Men ($n$ = 54) | Women ($n$ = 107) | Men ($n$ = 44) | Women ($n$ = 83) | Men ($n$ = 148) | Women ($n$ = 278) |
| 1-Semester Persistence | | 94.4% | 95.3% | 93.2% | 91.6% | 87.2% | 88.8% |
| 1-Year Retention | | 77.8% | 80.4% | 75.0% | 80.7% | 68.9% | 74.8% |
| 4-Year Graduation | | 13.0% | **29.9%** | 13.6% | **33.7%** | 24.3% | 24.8% |
| 5-Year Graduation | | 40.7% | 51.4% | 29.5% | **60.2%** | 40.5% | 46.8% |
| 6-Year Graduation | | 46.3% | 57.0% | 36.4% | **65.1%** | 48.0% | 53.2% |
| GPA | *M* | 2.11 | **2.55** | 2.67 | **2.80** | 2.42 | **2.88** |
| | *SD* | 0.87 | 0.77 | 0.98 | 0.83 | 0.94 | 0.82 |

*Note*. Bolded numbers are statistically significantly higher ($p < .02$ with Bonferroni adjustment for GPA, $p < .05$ for all others) than their gender counterpart for that variable.

Table 2.5

*Summary of Logistic Regression Results on Academic Performance Indicators Associated with Study Skills Participation*

| Outcome Variable | *B* | *SE* | *OR* | 95% CI | Wald Statistic | *p* |
|---|---|---|---|---|---|---|
| 1-Semester Persistence | 0.03 | 0.18 | 1.03 | (0.72, 1.48) | 0.03 | .86 |
| 1-Year Retention | -0.10 | 0.12 | 0.91 | (0.72, 1.15) | 0.63 | .43 |
| 4-Year Graduation | 0.07 | 0.12 | 1.07 | (0.84, 1.36) | 0.30 | .58 |
| 5-Year Graduation | -0.01 | 0.11 | 0.99 | (0.81, 1.23) | 0.00 | .96 |
| 6-Year Graduation | -0.10 | 0.11 | 0.91 | (0.74, 1.12) | 0.82 | .37 |

*Note*. CI = confidence interval for odds ratio (*OR*).

Table 2.6

*Summary of Logistic Regression Results on Academic Performance Indicators Associated with Number of Study Skills Sessions Attended*

| Outcome Variable | *B* | *SE* | *OR* | 95% CI | Wald Statistic | *p* |
|---|---|---|---|---|---|---|
| 1-Semester Persistence | 0.13 | 0.07 | 1.14 | (1.00, 1.30) | 3.86 | .02 |
| 1-Year Retention | 0.12 | 0.05 | 1.13 | (1.03, 1.24) | 7.18 | .01 |
| 4-Year Graduation | 0.12 | 0.05 | 1.12 | (1.02, 1.24) | 5.63 | .02 |
| 5-Year Graduation | 0.16 | 0.04 | 1.17 | (1.08, 1.27) | 14.77 | < .001 |
| 6-Year Graduation | -0.31 | 0.26 | 0.73 | (1.08, 1.27) | 1.47 | < .001 |

*Note*. CI = confidence interval for odds ratio (*OR*).

# CHAPTER III

## COLLEGE FRESHMEN LASSI SCORES AND ACADEMIC PERFORMANCE

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This dissertation follows the style and format of *Research in the Schools (RITS).*

## Abstract

Learning and Study Strategies Inventory (LASSI) scales were examined in relationship to short-term and long-term academic performance indicators (APIs) of students who completed a study skills workshop series, controlling for gender and ethnicity. Using a retrospective predictive design, criterion sampling was used to select a subset of students ($n = 450$) from an archival study skills dataset (2003-2008). A series of regressions resulted in only one statistically significant API (i.e., first-semester GPA; $p < .001$). In particular, the Anxiety and Motivation scales were statistically significantly related to GPA ($p < .001$), and resulted in an average increase of .03 and .05, respectively, per unit increase on the scale.


**Keywords** : Study Skills, Student Success, Gender, Ethnicity, Graduation, Retention, Persistence, Academic Support, At-risk, LASSI

COLLEGE FRESHMEN LASSI SCORES AND ACADEMIC PERFORMANCE

There has been an outcry from educators, employers, and politicians concerning a perceived skills gap that is preventing students in the United States from functioning in multiple arenas, including the academic and workplace environments (Bridgeland, Milano, & Rosenblum, 2011; Hart Research Associates, 2015; Hodge & Lear, 2011). Often educational institutions, especially high schools and colleges (Sparks & Malkus, 2013), receive the blame for the inadequacy of students' skills in areas such as critical thinking, mathematics, and interpersonal communication (Arum & Roksa, 2011). The stark reality in higher education is that 20% (Sparks & Malkus, 2013) to 60% (Bailey, 2009; Bettinger & Long, 2009) of beginning college students register for remedial coursework. Casting further dispersions towards education is that two out of three starting freshmen lack the necessary skills or emotional acumen to survive the exacting requirements of higher education (Bettinger & Long, 2009; Chen, Wu, & Tasoff, 2010).

Unfortunately, postsecondary academic institutions suffer the brunt of these problems while simultaneously being blamed for their continuance (Hart Research Associates, 2015; Sparks & Malkus, 2013). Higher education institutions experience the burden that emanates from this lack of student academic acumen in various ways. First, research has shown that students who lack the study strategies necessary for college (e.g., critical reading and thinking skills) are retained at lower rates and are less likely to graduate (Bailey, 2009; Complete College America, 2012). Given the need for higher education and critical thinking processes that employers in the current job market demand, as well as the political pressure from state and national entities to supply this demand, this trend is of paramount concern and one that administrators should address.

With the advent of performance-based funding, this impediment to retention and graduation can take its toll financially (Perna, Klein, & McLendon, 2014) because the additional time needed to complete developmental coursework can delay graduation and even increase student attrition (Ishitani, 2006; Parsad & Lewis, 2003). The added cost of developmental coursework, averaging more than $2 billion annually (Strong American Schools, 2008), compounds financial issues even further for higher education institutions.

## Educational Significance

In the majority of extant literature, the evaluation and assessment of study skills programs and instruction has been limited to short-term academic indicators (e.g., GPA) and instruments designed to assess student study perceptions or strategies (Credé & Kuncel, 2008), or even the combination of the two (Kartika, 2007). However, no literature was found that explored the relationship between these instruments and both short- and long-term academic performance indicators (API). In fact, only one study could be found that addressed the long-term effect of study skills on academic performance (see Jordan, Parker, Li, & Onwuegbuzie, 2015). Therefore, this study will help fill the research gap by exploring these relationships by using the Learning and Study Strategies Instrument (LASSI) and multiple APIs (i.e., GPA, 1-semester persistence [fall-to-spring], 1-year retention [fall-to-fall], and graduation [4-, 5-, 6-year]). This relationship was probed in context with at-risk populations, another area that deserves scrutiny due to the lack of research in reference to study skills.

This study provides information concerning the effect of study skills on academic performance (short- and long-term) and on specific at-risk populations in addition to identifying common problem areas (LASSI scales) for students, which might enable

educational personnel to make more informed decisions in the future concerning student support program implementation and creation. Moreover, it is hoped that higher education institutions will benefit from this study's findings and be able to identify specific areas to target concerning student study skill improvement. Finally, this study might help enlighten educators, employers, and community leaders concerning the effect of study skills as an academic intervention program.

## Purpose and Research Question

The purpose of this study is to identify what relationship, if any, exists between LASSI scale performance (e.g., Anxiety, Motivation, Self Testing) and APIs of students who completed a study skills workshop series, controlling for common at-risk factors. To address the study's purpose, the following research question were explored: What is the relationship between LASSI scale performance (e.g., Anxiety, Motivation, Self Testing) and APIs, both long-term (i.e., degree completion [4-, 5-, 6-year], 1-year retention [fall-to-fall]) and short-term (i.e., first-semester GPA, 1-semester persistence [fall-to-spring]), of first-semester freshmen (fall, 2003-2008) who participated in a 6-week study skills workshop series controlling for gender and ethnicity?

## Conceptual Framework

Given the study's focus on student support and student success, Tinto's (1997, 2007) theory of student departure/retention and Astin's (1984, 1999) theory of student involvement served as the conceptual framework. Whereas Tinto's theory (1997, 2007) focuses on causes for student attrition and means by which students can be retained, Astin (1984, 1999) represents the proverbial "other side of the coin" by analyzing causes for student success. Interestingly, both authors advocate the use of academic support

programs (e.g., a study skills workshop series) to bolster students' learning and success, thereby decreasing student attrition.

## Review of the Related Literature

Researchers have been studying students' use of and the corresponding effect of study skills and strategies on academic performance for over a century (Moore, Readance, & Rickleman, 1983; Richardson, Robnolt, & Rhodes, 2010). As such, educational literature is rife with studies that focus on individual skills, the necessary skills for academic success, and the effect that these skills have in educational institutions for all levels (Astin, 1999; Credé & Kuncel, 2008; Richardson et al., 2010; Tinto, 1997). The literature supports the conclusion that students who possess adequate study skills not only perform better academically but also report a greater involvement in their own education (Kartika, 2007; Proctor, Prevatt, Adams, & Reaser, 2006; Robyak, 1978; Sanoff, 2006; Urciuoli & Bluestone, 2013). Given the educational effect that possessing, and consequently applying, study strategies can have on students' academics, programs and services designed to teach and improve students' skills could affect universities and colleges, especially when taken in context with student populations that are considered at risk.

### Necessity of Academic Support

Although the United States once led the international community with the highest graduation rates in the world (Abel, 2000), it has recently fallen in global educational standings, from first to 16th (Chalian, 2012). Furthermore, Pearson's (2014) composite index of global educational rankings, from primary education through secondary graduation, revealed that the United States ranked 14th internationally in education, 11th

concerning cognitive skills, and 20th for overall educational attainment. Adding to this negative swing for academics in the United States, approximately 66% of all first-time freshmen lack the preparation necessary to adequately navigate the rigors inherent in higher education (Bettinger & Long, 2009; Chen et al., 2010). A prime result of this skills deficit is the higher education developmental course enrollment numbers, which range from a minimum of 20% of the first-time freshmen population (Sparks & Malkus, 2013) to as high as 60% in some colleges and universities (Bailey, 2009; Bettinger & Long, 2009). Unfortunately for education administrators, this skills deficit has been noticed by employers and college faculty (Bridgeland et al., 2011; Hart Research Associates, 2015; Hodge & Lear, 2011) as well as politicians, including the United States President (Obama, 2009) who highlighted national educational deficits and consequently demanded that the U.S. educational system return to the top of the global education charts by the year 2020.

Responding to the external pressures from employers and politicians and the internal pressures of faculty members who want their students to be academically competitive, institutions of higher education have started exploring formal support programs as a method by which students' academic performance and graduation rates may be improved. By definition, academic support includes any resources, programs, or specific instruction "provided to students in the effort to help them accelerate their learning progress, catch up with their peers, meet learning standards, or generally succeed in school" (Academic support, 2013, para. 1).

Not only have national rankings fallen over the last several years, but researchers (Bailey, 2009; Complete College America, 2012) have conducted studies and identified

that one of the main reasons that the United States has fallen behind academically is that students do not have the required skills and strategies (e.g., critical reading skills, note-taking methods, test-taking strategies) to survive or excel in education. Inductively, this lack of academic skills could account for the lack of higher education persistence (e.g., 1-year retention and graduation). Fortunately for educational institutions, several studies have shown that the use of academic support programs specifically created to promote the improvement of students' study skills and strategies can enhance success in academia (Kartika, 2007; Proctor et al., 2006; Robyak, 1978; Sanoff, 2006; Urciuoli & Bluestone, 2013).

**Importance of Study Skills**

The results of several studies have indicated that students who possess adequate study skills perform better in academic environments (Credé & Kuncel, 2008; Richardson et al., 2010; Tinto, 1997). Moreover, students who applied study skills and strategies to their academic endeavors were more engaged in the classroom and had improved academic performance (Kartika, 2007; Proctor et al., 2006; Robyak, 1978; Sanoff, 2006; Urciuoli & Bluestone, 2013). Researchers have also promoted the use of study skills in formal classroom settings as well as in programs created to boost students' academic performance, thereby increasing their postsecondary persistence (Al-Hilawani & Sartawi, 1997; Kartika, 2007; Urciuoli & Bluestone, 2013).

Illustrating another perspective on the topic, Nicaise and Gettinger (1995) found that students who had academic difficulties often lacked study skills, not talent or intelligence. Several studies supported Nicaise and Gettinger's (1995) claim, providing statistically significant associations between academic success and study skills (Al-

Hilawani & Sartawi, 1997; Credé & Kuncel, 2008; Kartika, 2007); however, these studies focused on relatively short-term performance (e.g., semester GPA) rather than long-term performance (e.g., graduation). In fact, research analyzing the short-term analyses of study skills and their impact on education represent the norm, with long-term effects, (i.e., 1-year and 1-semester retention rates) only recently gaining attention from researchers (e.g., Al-Hilawani & Sartawi, 1997; Credé & Kuncel, 2008; Kartika, 2007; Urciuoli & Bluestone, 2013). Only one study, to date, analyzed the effect of a study skills program and graduation (Jordan et al., 2015). Unfortunately, the narrow scope (i.e., short-term academic performance) of the majority of study skills research has caused a gap where a minimal amount of research concerning study skills and long-term academic performance exists.

**At-risk Demographics**

According to Koball et al.'s (2011) report to the U.S. Department of Health and Human Sources, in which they synthesized the studies and reports of over a decade of research on at-risk youth, there exists no commonly used definition for the term *at-risk* (or at risk) within academia. However, the term appears closely associated with education at all levels (i.e., early childhood through graduate) and has been associated with education since the mid-1980's (Tompkins & Deloney, 1994). At-risk seems to be most commonly associated with properties that threaten students' abilities to function in academic environs, to persist from one semester or one year to the next, or even to graduate (Braxton & Hirschy, 2005; Nora, Barlow, & Crisp, 2005; Reason, 2009a; Tinto, 1975, 1997).

The factors that affect students' retention, persistence, departure, and graduation, thereby placing them at risk, have been of constant interest to researchers and educational institutions for over 70 years (Braxton, 2000). Now in the ninth decade of research concerning these topics, the literature abounds with studies (e.g., Hirschy, Bremer, & Castellano, 2011; Peltier, Laden, & Matranga, 1999; Reason, 2009b) about student and institutional characteristics that affect students' and their academic performance. The factors that affect students' persistence, retention, and general academic performance include internal characteristics such as psychological and emotional issues (e.g., coping skills; Tinto, 1975, 1997) and biological factors (e.g., gender, health; Braxton & Hirschy, 2005; Nora et al., 2005; Reason, 2009a; Tinto, 1975, 1997). Additionally, external issues such as economic concerns (e.g., SES, financial aid; Braxton & Hirschy, 2005; Nora et al., 2005; Reason, 2009a; Swail, Redd, & Perna, 2003; Tinto, 1975, 1997) and student and institutional culture and diversity (Braxton & Hirschy, 2005; Nora et al., 2005; Swail et al., 2003) contribute to students' academic performance. This plethora of factors can either increase or decrease the likelihood of students' persistence, retention, and graduation; as such, students who fall into specific areas of these factors are less likely to perform well academically, thereby earning the label "at-risk." For this study, a student's ethnicity and gender were the primary focus.

The presence or lack of presence of specific ethnic groups and ethnic diversity within academia has concerned academicians and the United States society for most of the 20th and all of the 21st centuries (Kim, 2011; Lucas & Paret, 2005). As such, ethnicity and a campus's ethnic diversity has been a commonly researched topic in education. A large portion of this ethnicity-based research provides evidence that a

student's ethnicity is an important differentiating feature when analyzed in context with a student's academic performance (Astin, 1975; Aud, Fox, & KewalRamani, 2010; Keller, 2001; Kim, 2011). Additionally, on a national level, ethnic groups are retained and graduate at varying levels depending on their institution type (e.g., private, public, for profit; see Table 3.1).

In addition to ethnicity, gender has been a commonly examined at-risk factor in literature, with women shifting from underrepresentation and underperformance in the decades preceding the 1980s to a reversal of the trend in the 1990s which continues to the present (Ewert, 2012). In several studies, men have been reported as having a higher risk of academic distress (e.g., departure, low academic performance) than women (Buchman & DiPrete, 2006; Ewert, 2012; Kim, 2011). Specifically, according to Ewert's (2012) analysis of three separate academic cohorts, on average, women outperformed men concerning GPA (2.72 and 2.50, respectively) and were 13% to 20% more likely to graduate than men, depending on the cohort. Additionally, like ethnicity, the rate at which men and women differ concerning retention rates and graduation rates changes in relation to the type of higher education institution attended (National Center for Education Statistics [NCES], 2014a, 2014b; see Table 3.1).

**Learning and Study Strategies Inventory**

Instruments and inventories are often used to assess the effect of study skills treatments on participants. The LASSI (H & H Publishing, 2011; Hewlett, Boonstra, Bell, & Zumbo, 2000; Prevatt, Reaser, Proctor, & Petscher, 2007) is one of the most extensively used instruments in the United States. Intended to yield diagnostic and prescriptive information about students' perceptions of their study strategies, it is also

often used as a program assessment tool (Weinstein, 1987; Weinstein & Palmer, 2002). The LASSI (2nd ed.) has 10 scales linked to specific study strategies and each scale has eight corresponding items, 80 total for the instrument, that are addressed using a 5-point Likert scale (H & H Publishing, 2005; Weinstein & Palmer, 2002).

The 10 scales are grouped into three larger, more comprehensive, learning strategies (i.e., Will, Self-regulation, Skill), each comprised of a minimum of three individual LASSI scales (Weinstein & Palmer, 2002). The Will learning strategy includes the following LASSI scales: Anxiety, representing levels of academic concern and/or worry, Attitude, representing opinions about academics and success, and Motivation, representing academic drive and grit (Weinstein & Palmer, 2002). Self-regulation includes the following LASSI scales: Concentration, representing capability to focus, Self Testing, representing propensity to review information, Study Aids, representing the use of available academic support, and Time Management, representing the application of time saving strategies (Weinstein & Palmer, 2002). Skill is the third LASSI scale group and consists of the following: (a) Information Processing, representing the use of various organizational techniques for learning, (b) Selecting Main Ideas, representing contextual strategies for identifying important, and (c) Test Taking Strategies, representing strategies for assessing comprehension (Weinstein & Palmer, 2002). See Table 3.2 for more detailed information.

Although the LASSI is used by programs and departments in thousands of higher education institutions across the United States (H & H Publishing, 2005), there is a limited amount of psychometric (Flowers, Bridges, & Moore, 2012). Flowers (2003) and Flowers et al. (2012) provided confirmation of the LASSI's (1st ed.) consistency by

means of reliability data and test-retest. The LASSI (1st ed.) also possessed strong test-retest correlations (.72 to .85; Weinstein, 1987). However, this information is lacking for the LASSI (2nd ed.) as Weinstein and Palmer (2002) provided only coefficient alphas for the individual scales (see Table 3.2), thereby raising questions regarding the instrument's validity.

**Summary**

With researchers' scrutiny over the last 100 years, study skills and their positive effect on student academic performance has been well documented (Credé & Kuncel, 2008; Richardson et al., 2010). Unfortunately, the majority of this research centers upon the short-term academic performance of students (Credé & Kuncel, 2008; Jordan et al., 2015; Richardson et al., 2010), rather than the almost ignored effect of study skills on long-term student success (Jordan et al., 2015). This lack of research has required interested parties (e.g., administrators, faculty, politicians, employers) to make decisions concerning support programs and study skills instruction with limited information. As such, there is a need for further research on the long-term effect of study skills as well as their impact on the academic success of at-risk students.

## Method

The study's research design was non-experimental in nature due to the lack of direct control of independent variables (Johnson & Christensen, 2010; Kerlinger, 1986). Given this nature, the research design followed Johnson's (2001) two-dimensional typology by incorporating a time dimension and a research objective. Reflecting this typology, the data were accumulated for a 6-year period (i.e., 2003-2008 [time dimension]) and the research objective of the study was to identify what relationship, if

any, existed between LASSI scale performance and APIs of first-semester freshmen who completed a study skills workshop series, controlling for common at-risk factors, thereby creating what Johnson (2001) and Johnson and Christensen (2010) refer to as a retrospective predictive design.

**Participants**

As the data in question were historical in nature, archival university data were used for this study. The undergraduate population of a large, public university in a southeastern state (fall 2003-2008) consisted of 79,280 undergraduate students, an average of about 13,213 undergraduates each fall semester. Across this time, first-semester freshmen accounted for 12,766 students of this total and are the target population. By the nature of being first-semester students, these freshmen had fewer chances to participate in, or be affected by, alternate interventions that might influence them academically, thereby, potentially, affecting the results of this study (i.e., multiple-treatment interference; Onwuegbuzie, 2003). For further information concerning university populations, see Table 3.3.

A 6-week study skills workshop series was conducted from 2003-2008. The program consisted of six, 50-minute sessions addressing various study habits, strategies, and skills (e.g., time management, reading, stress management, test-taking, note-taking, procrastination). All students at the university could take the free workshop series; therefore, all undergraduate classifications were represented (see Table 3.3). However, this study's participants were selected based on a criterion sampling scheme (Creswell, 2008), including the following three criteria: (a) participants must have been first-semester freshmen; (b) participants must have self-selected participation in the study

skills workshop series; and (c) participants must have been enrolled during the fall semesters, 2003-2008. As such, the sample size was 450 first-semester freshmen participants.

**Measures**

APIs (e.g., course grades, GPA, graduation) are common educational assessment tools used to understand and determine student success and program effectiveness (Banta & Palomba, 2015). For this study, an API is a categorizing term including first-semester GPA, 1-semester persistence, graduation, and 1-year retention. These four indicators are grouped according to time of occurrence; in other words, GPA and 1-semester persistence will represent short-term performance and graduation (i.e., 4-, 5-, 6-year) and 1-year retention will represent long-term performance.

Arguably one of the most regularly explored variables in education (Kuncel, Credé, & Thomas, 2005), GPA has been a variable of interest to many study skills researchers (e.g., Credé & Kuncel, 2008; Hassanbeigi et al., 2011; Pepe, 2012), thereby making it a common comparison factor within the literature. For this study, first-semester GPA at the institution in which the student participated in the study skills workshop series was used. As only first-time freshmen comprise the study's sample, their coursework would be similar. This similarity in coursework, primarily freshman non-degree specific courses, should mitigate the potential disparities in grading practices across curriculum.

In contrast to the almost universal definition and use of GPA, the term *persistence* is often undifferentiated within the literary body, commonly used interchangeably with retention and even sometimes graduation (Hagedorn, 2006). The NCES does

differentiate between persistence and retention, claiming the former is a "student measure," whereas the latter is an "institutional measure" (Hagedorn, 2006, p. 6). Despite the lack of agreement concerning the use of the term persistence, researchers use it consistently referring to whether a student matriculates from one semester to the next. For this study, persistence was the matriculation of a student from one semester to the following semester. Specifically, persistence was a binary variable (i.e., yes or no) concerning study skill participants' matriculation from the fall semester to the spring semester of their first year.

Long-term indicators of academic success are also important to this study because they often are overlooked in the study skills research community (Jordan et al., 2015). According to the NCES (2015a), graduation is the percent of full-time credential-seeking students who complete their first program within 150% of the normal time required for completion. To answer this study's research questions, graduation was a dichotomous variable (i.e., yes or no) indicating whether a student graduated in a given span of time (i.e., 4-, 5-, 6-years). Retention is the second long-term API, defined as the rate at which students matriculate from the fall semester to the following fall semester (NCES, 2015b). For this study, retention was defined as whether or not the student was retained (i.e., fall-to-fall; yes or no).

The term at-risk consists of multiple factors (Lopez-Wagner, Carollo, & Shindledecker, n.d.), including the number of developmental courses necessary (Bremer et al., 2013), the lack of prerequisite academic training (Astin, Korn, & Green, 1987; Hirschy et al., 2011), and common demographic demarcations such as gender and ethnicity (Hirschy et al., 2011; Peltier et al., 1999). There are two factors of interest for

this study: (a) gender and (b) ethnicity (i.e., African American, Hispanic, White). These factors are considered at-risk because specific characteristics, or combination of characteristics, are strongly correlated with poor academic performance. One specific example is that Hispanic American men typically perform poorer academically (i.e., graduation, retention rate) than their Hispanic American women counterparts (NCES 2014a, 2014b). All information was gathered from the university at which the study skills workshop series was conducted.

The LASSI second edition (Weinstein & Palmer, 2002) is a diagnostic and predictive instrument designed to measure students' use of learning and study strategies. One of the LASSI's key benefits is its functional use as a pre-test and post-test, of which the latter was employed for this study. The instrument consists of 80 multiple-choice items, all using a 5-point Likert scale, which correspond to 10 scales, composed of eight items each, that represent three main components of strategic learning: (a) skill, (b) will, and (c) self-regulation (see Table 3.2; Weinstein & Palmer, 2002). Each of the 10 scales possesses a scale score that is the sum of the eight constituent items. According to Weinstein and Palmer (2002), the coefficient alphas for the scales range from .73 to .89 (see Table 3.2) suggesting a relatively strong internal consistency.

**Analyses**

Several statistical techniques were used for this study. Each of the variables was examined using descriptive statistics. Additionally, two statistical regression techniques, a multiple regression and multiple logistic regressions, were used to determine the relationship between LASSI scales and academic performance. Both the multiple regression and multiple logistic regression analyses result in a statistical model that

relates the output (i.e., dependent variables) to multiple explanatory variables (i.e., independent variables; Thompson, 2006). If the dependent variable is a measured quantity on a continuous scale (e.g., GPA), then a multiple regression analysis may be appropriate.

In contrast, a logistic regression is used when the output variable is dichotomous or binary (Peng, Lee, & Ingersoll, 2010), which the dependent variables of 1-semester persistence, 1-year retention, and 4-, 5-, 6-year graduation are. However, a multiple logistic regression is appropriate when the dependent variable is binary and when there are multiple independent variables involved in the analysis (Thompson, 2006), as was the case with this study. A positive answer (i.e., yes) for the aforementioned dependent variables was represented as a 1 and a negative answer (i.e., no) was represented as a 0.

## Results

A multiple regression was used to identify the relationship between LASSI scale performance and first-semester GPA, controlling for gender and ethnicity. The VIFs for the data ranged from 1.10 to 2.65, thereby indicating a lack of multicollinearity. Additionally, the other statistical assumptions necessary for multiple regressions were met (i.e., normality [visual inspection of the Q-Q plots], homoscedasticity [scatterplot shows no relationship], independence [Durbin-Watson = 2.17]). The multiple regression model was found to be statistically significant ($F[13, 436] = 6.77$, $p < .001$) and accounted for approximately 17% of the variance in semester GPA ($R^2 = .17$, $R^2_{adj} = .14$). The raw and standardized coefficients are provided in Table 3.4. Of the LASSI scales, only Motivation and Anxiety were statistically significant predictors of GPA ($p < .001$). Motivation (b = .05) had the largest unstandardized coefficient in the model followed by

Anxiety (b = .03). As such for every unit increase in the Motivation and Anxiety scales, GPA is predicted to improve 0.05 and 0.03 points, respectively.

Multiple logistic regressions were used to identify the relationship between LASSI scale scores and APIs (i.e., 1-semester persistence, 1-year retention, graduation) among first-semester freshmen, controlling for gender and ethnicity. The VIFs for the data ranged from 1.10 to 2.65, thereby indicating a lack of multicollinearity. Moreover, Box-Tidwell procedures and Durbin-Watson tests (ranging from 2.06 to 2.26) indicated that the data were linear and independent.

The full model was not a statistically significant predictor for 1-semester persistence, $\chi^2$ (13) = 15.16, $p$ = .30, $N$ = 450. Similar to persistence, the full model was not a statistically significant predictor for 1-year retention, $\chi^2$ (13) = 20.76, $p$ = .08, $N$ = 450. Concerning graduation, the full models were not statistically significant for 4-year ($\chi^2$ [13] = 17.65, $p$ = .17, $N$ = 450), 5-year ($\chi^2$ [13] = 14.64, $p$ = .33, $N$ = 450), or 6-year graduation ($\chi^2$ [13] = 16.17, $p$ = .32, $N$ = 450).

**Delimitations and Limitations**

A large, regional university in a southeastern state serves as the foundation of this study. Although the study skills workshop series existed before 2003 and continues until the present time, only data from the 2003-2008 (fall-to-fall) academic years were analyzed for the study because of the changes in university calculation methods and policies concerning GPA. Given that the 2003-2008 academic years were scrutinized, data were archival and consisted of academic, demographic, and programmatic data points.

Possible threats to validity, both external and internal, were examined and minimized, thereby enhancing the analytical design. The first external threat to validity, population validity, is inherent to the sampling format and population of the study. As this study focuses on a single subgroup identified via criterion sampling at only one university, the validity of the study is threatened (Onwuegbuzie, 2003). However, according to Wilkinson and the Task Force on Statistical Inference (TFSI; 1999), the "explicit comparison of sample characteristics with those of a defined population across a wide range of variables" enhances the representativeness of a study, thereby allaying the threat to validity (p. 595). Although Wilkinson and TFSI (1999) only discussed convenience sampling, their argument equally applies to other non-random sampling techniques (e.g., criterion sampling).

In addition, higher education institutions are flooded with a variety of academic services and student support designed to enhance or to facilitate students' academic abilities, to improve students' retention, and to increase students' knowledge of collegial services. Given this reality, it is possible, if not likely, for students to be involved in multiple interventions at any point in their college careers, which, in turn, could mask the effects of a program being researched (Onwuegbuzie, 2003), thereby causing researchers concern. As this study focuses on the effect of a single academic support program on students' academics, it is important that multiple-treatment interference be addressed. To limit the external threat of multiple-treatment interference, only first-semester freshmen, who have not had the time to be exposed to as many interventions, were this study's focus.

The possibility of mortality and maturation threaten the internal validity of this study. Within any study concerning the completion of activities, the failure of participants to complete the prerequisite outcomes is troublesome (Johnson & Christensen, 2010). However, mortality, sometimes identified as attrition, only threatens internal validity when participants depart differentially creating irregularities between the study's groups (Onwuegbuzie, 2003). For this study, the threat of mortality is addressed by the study's long-term nature, which includes multiple cohorts of intervention to act as a bulwark against the loss of participants over time.

According to Johnson and Christensen (2010) and Onwuegbuzie (2003), maturation is a threat to internal validity concerning the physical and mental processes experienced by participants through the passage of time. These processes can be long-term (e.g., aging), variable-term (e.g., learning), and short-term (e.g., boredom; Johnson & Christensen, 2010). The nature of the study's design (i.e., 6-year retrospective) requires that this internal validity threat be addressed. Therefore, multiple variables, long- and short-term, were used to determine the effect of the intervention, which provides a more in-depth view of the program beyond what could be gained from investigating a single variable.

## Discussion

It has been argued that a skills gap exists regarding students' actual skills and those required to successfully manage the rigors of higher education (Sparks & Malkus, 2013). Indeed, research indicates that students not only lack the skills needed for college, but that this skills gap has expanded to include the workforce (Bridgeland et al., 2011; Hart Research Associates, 2015; Hodge & Lear, 2011). Educational theorists Astin

(1984, 1999) and Tinto (1997, 2007) have argued that individuals who are more actively involved in their academic studies are not only more likely to avoid attrition but to shine scholastically. Additionally, Tinto (1997) advocated for academic support with the express purpose of improving students' scholastic achievements. In support, several articles found study skills instruction to have a positive effect on students' academic performance (Al-Hilawani & Sartawi, 1997; Kartika, 2007; Urciuoli & Bluestone, 2013), which, in turn, lowered student attrition.

Although the LASSI is one of the most commonly used study strategies inventories (H & H Publishing, 2011; Hewlett et al., 2000), few studies have investigated the second edition or the predictive relationship between the individual scales and APIs, particularly those measuring long-term performance. Moreover, much of the extant literature is mixed concerning the overall effectiveness of the LASSI to assess student academic performance (Flowers et al., 2012; Prus, Hatcher, Hope, & Gabriel, 1995). As such, the results are particularly important. The effect of LASSI scales on GPA was statistically significant, which mirrors findings within the literature (Bender & Garner, 2010), but no analyses indicated statistically significant relationships to any of the other APIs. The individual scales of Anxiety and Motivation were statistically significant predictors of first-semester GPA. Specifically, for each point increase on the LASSI scale Anxiety (8-40), GPA improved by .03, whereas for every point increase in Motivation, GPA improved by .05.

According to the Weinstein and Palmer (2002), the Anxiety scale is a measure of how tense or concerned a student is with a given task; as such, a low score indicates high anxiety and high score indicates low anxiety. Perhaps a more apt description of the

Anxiety scale is a measure of how well an individual copes with anxiety—a low score indicating either a lack of coping skills or a lack of the application of coping skills and a high score indicating the opposite. As such, the positive predictive relationship between Anxiety and GPA is not only statistically significant, but also educationally significant. The greater students' ability to cope with anxiety, the higher the GPA they earn. In addition, there are numerous studies in which the negative effect of high anxiety on student performance has been documented (e.g., Alkhateeb & Nasser, 2014; Hersh & Hussong, 2006; Kelly & Barry, 2010). This literature may indicate a growing need for training and support resources to help students counter and cope with the negative aspects of anxiety. For example, students who scored lower on the Anxiety scale could receive focused interventions to minimize their personal anxiety. Another alternative would be to incorporate additional coping skills into established study skills programs, thereby providing instruction for all participants and avoiding the potential marginalization of more anxious students. Either way, educators and administrators would find addressing this topic beneficial for students' psychological and emotional well-being as well as its boost to student GPA.

Like Anxiety, the topic of Motivation warrants further research in higher education for several reasons. To begin with, Motivation, or a students' academic drive (Weinstein & Palmer, 2002), has been shown to have positive correlation with academic performance (Marrs, Sigler, & Hayes, 2009; Nist, Mealey, Simpson, & Kroc, 1990; Sinkavich, 1991). However, students with higher levels of motivation may have been more likely to choose to be program participants as they may have been more willing to participate in a study skills workshop series. This factor could account for the effect of

Motivation on GPA within this study. Moreover, students with more drive may possess the ambition and/or willingness to overcome academic hardships, thereby increasing their likelihood of performing at a higher academic level (Wibrowski, Matthews, & Kisantas, 2016; Zimmerman, Bandura, & Martinez-Pons, 1992). A third possible explanation for the influence of the Motivation scale could be a factor inherent to the study skills workshop series or its instruction may have directly influenced the participants by stimulating their desire to enhance their academic performance, determining which requires further research. Given the potential effect of increased motivation on GPA, students who exhibit low motivation could receive targeted interventions designed to enhance their academic drive, thereby enhancing their academic performance. In contrast, instructors could incorporate techniques and strategies designed to enhance motivation into existing study skills instruction or academic support program, which would avoid singling out less motivated students.

Anxiety and Motivation are both components of the Will category. Unlike scales that represent hard skills, also known as academic or technical skills, like Selecting Main Ideas (i.e., critical reading), both Anxiety (coping skills) and Motivation (academic drive) are soft skills, also known as personal skills—more emotionally and psychologically laden (Robles, 2012)—and are sometimes marginalized by educators and administrators due to the difficulty of measuring these skills (Heckman & Kautz, 2012; Kantrowitz, 2005). However, the topic deserves further examination as employers and students place value on these soft skills (Williams, 2015), especially given the study's findings.

However, several researchers have criticized the LASSI, arguing that it does not truly measures what it is supposed to measure (Melancon, 2002; Prus et al., 1995). For

example, Time Management is a skill crucial to academic and work pursuits alike (Williams, 2015); however, no connection to APIs was identified for this scale in this study. In fact, analyses indicated that LASSI scales were not associated with five of the six APIs tested (i.e., 1-semester persistence; 1-year retention; 4-, 5-, 6-year graduation). Similar findings can be found in other studies in which only predictive relationships for short-term outcomes and only in relation to specific scales were reported. For example, Marrs et al. (2009) reported that only Motivation had a predictive relationship to course letter grades, whereas Seabi (2011) identified Attitude, Anxiety, and Test Strategies as predictors for end-of-course exams. These limited relationships between scales and outcomes may support LASSI critics as they question whether or not the LASSI captures the skills accurately.

Several researchers have investigated the predictive relationships between the LASSI and short-term academic performance. Alkhateeb and Nasser (2014) reported the LASSI was a beneficial student diagnostic tool, had statistically significant pre-post results (~5-week span), but at lower rates than Weinstein and Palmer (2002) reported, and had statistically significant effect on semester GPA. Cano's (2006) and Dill, Gilbert, Hill, Minchew, and Sempier's (2014) studies mirrored the LASSI's impact on GPA in reference to end-of-year GPA. Additionally, when referencing LASSI's use as an intervention or program assessment, Seabi (2011) found a statistically significant predictive relationship in reference to end-of-year exams and Marrs et al. (2009) noted the same in reference to end-of-course letter grades. All of these studies focused on the short-term relationship between LASSI scale scores and achievement; however, no studies were found that investigated the long-term relationships between the LASSI and

academic achievement (e.g., graduation). That the results of this study indicated that no predictive relationship existed between LASSI scale scores and 1-year retention or graduation (4-, 5-, or 6-year) should cause educators and administrators to pause and ask why. As has been observed in this study, in long-term scenarios, past a semester or a year, the study skills and strategies learned during the workshop, and assessed with the LASSI, either faded and had no impact on longer term predictors. This lack of effect broaches the necessity of refresher courses for high risk students or it could indicate the LASSI was not effective at actually capturing the students acquisition of study skills. Therefore, as the LASSI is one of the most commonly used inventories in higher education (H & H Publishing, 2011; Hewlett et al., 2000) in regards to study and learning strategies, a better understanding of the LASSI (2nd ed.) is imperative for educational administrators and program coordinators to increase their comprehension of the instrument's strengths, weaknesses, and intended uses so that they may better assess and evaluate academic support and study skills programs.

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Table 3.1

*2012-2013 1-year Retention Rate and 2007 6-year Graduation Rate by At-risk Factors for 4-year Postsecondary Institutions*

| At-risk Factor | Overall | | Public | | Private, Non-profit | | Private, For-profit | |
|---|---|---|---|---|---|---|---|---|
| | 1-year Retention Rate | 6-year Graduation Rate | 1-year Retention Rate | 6-year Graduation Rate | 1-year Retention Rate | 6-year Graduation Rate | 1-year Retention Rate | 6-year Graduation Rate |
| Overall | 72.9% | 59.4% | 71.4% | 57.7% | 80.3% | 63.1% | 62.8% | 31.9% |
| Gender | | | | | | | | |
| Men | 56.5% | 56.5% | 54.6% | 54.6% | 62.3% | 62.3% | 35.7% | 35.7% |
| Women | 61.9% | 61.9% | 60.3% | 60.3% | 67.7% | 67.7% | 28.3% | 28.3% |
| Ethnicity | | | | | | | | |
| White | 62.9% | 62.9% | 60.7% | 60.7% | 65.7% | 65.7% | 39.9% | 39.9% |
| African American | 40.8% | 40.8% | 40.3% | 40.3% | 44.6% | 44.6% | 22.4% | 22.4% |
| Hispanic | 52.5% | 52.5% | 50.7% | 50.7% | 55.7% | 55.7% | 35.0% | 35.0% |

Note. Data gathered from the National Center for Education Statistics (NCES, 2014a, 2014b).

Table 3.2

*LASSI Components, Scales, Definitions, and Coefficient Alphas*

| Component | Scale | Definition | Coefficient Alpha |
|---|---|---|---|
| Skill | Information Processing | Students' reported use of imagery, verbal elaboration, organization strategies, and reasoning skills as learning strategies to improve learning, recall, and understanding. | .84 |
| | Selecting Main Ideas | Students' reported ability to distinguish critical information from less important information. | .89 |
| | Test Strategies | Students' reported use of test preparation and test-taking strategies. | .80 |
| Will | Anxiety | Students' reported levels of worry and concern in relation to school and academic performance. | .87 |
| | Attitude | Students' outlooks of and view of college and achieving success. | .77 |
| | Motivation | Students' drive and readiness to exert the effort needed to complete activities. | .84 |
| Self-regulation | Concentration | Students' reported ability to focus and sustain their attention on activities and processes. | .86 |
| | Self Testing | Students' reported use of strategies to review and determine their level of comprehension of information or processes. | .84 |
| | Study Aids | Students' reported use of academic support (materials, resources, methods) to learn and maintain information. | .73 |
| | Time Management | Students' reported application of time management techniques. | .85 |

*Note*. Weinstein and Palmer, 2002.

Table 3.3

*Enrollment Population by Classification for Fall 2003-2008 Semesters at the Study's Institution*

| *N* | Class | Fall 2003 | Fall 2004 | Fall 2005 | Fall 2006 | Fall 2007 | Fall 2008 | Total |
|---|---|---|---|---|---|---|---|---|
| Students (*N* = 79,280) | Senior | 3,133 | 3,378 | 3,479 | 3,664 | 3,861 | 4,205 | 21,720 |
| | Junior | 2,618 | 2,836 | 3,021 | 3,157 | 3,349 | 3,390 | 18,371 |
| | Sophomore | 2,654 | 2,644 | 2,974 | 3,161 | 3,205 | 3,146 | 17,785 |
| | Freshman | 1,274 | 1,298 | 1,514 | 1,587 | 1,511 | 1,454 | 8,638 |
| | First-Time Freshman | 1,829 | 2,144 | 2,209 | 2,220 | 2,240 | 2,124 | 12,766 |
| Study Skills (*N* = 2,284) | Senior | 45 | 31 | 22 | 13 | 25 | 21 | 157 |
| | Junior | 81 | 63 | 69 | 52 | 68 | 64 | 397 |
| | Sophomore | 82 | 86 | 87 | 82 | 103 | 97 | 537 |
| | Freshman | 308 | 209 | 210 | 139 | 171 | 156 | 1,193 |
| | First-Time Freshman | 254 | 150 | 130 | 58 | 84 | 54 | 730 |

Table 3.4

*Regression Results Summary for LASSI Scales Predicting First-semester GPA*

| Predictor Variable | b | *SE* | β | *t* | *p* |
|---|---|---|---|---|---|
| Anxiety | 0.03 | 0.01 | 0.23 | 3.76 | < 0.001 |
| Attitude | -0.02 | 0.01 | -0.08 | -1.40 | 0.16 |
| Concentration | 0.00 | 0.01 | 0.00 | 0.02 | 0.99 |
| Information Processing | 0.00 | 0.01 | 0.00 | 0.01 | 1.00 |
| Motivation | 0.05 | 0.01 | 0.31 | 4.37 | < 0.001 |
| Selecting Main Ideas | -0.02 | 0.01 | -0.11 | -1.63 | 0.10 |
| Self Testing | 0.00 | 0.01 | -0.01 | -0.12 | 0.90 |
| Study Aids | -0.02 | 0.01 | -0.10 | -1.64 | 0.10 |
| Test Strategies | 0.00 | 0.01 | -0.02 | -0.22 | 0.83 |
| Time Management Techniques | 0.01 | 0.01 | 0.06 | 0.82 | 0.41 |

*Note*. All variables were controlled for gender and ethnicity.

# CHAPTER IV

# IDENTIFICATION OF AND RELATIONSHIP BETWEEN LASSI SUBGROUPS AND THEIR CORRESPONDING ACADEMIC PERFORMANCE

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This dissertation follows the style and format of *Research in the Schools (RITS).*

## Abstract

By means of a Latent Profile Analysis, three subgroups were identified using study skills workshop series participants' ($n$ = 450) Learning and Study Strategies Inventory (LASSI) scale performance, with each group possessing correspondingly higher scores in all 10 scales. Following a retrospective predictive research design to determine what relationship, if any, existed between these subgroups and academic performance indicators (APIs), a series of regressions were conducted. Only one API was identified as statistically significant (first-semester GPA [$p < .001$]), thereby calling into question the long-term relationship between LASSI scores and academic performance.


**Keywords**: Study Skills, Student Success, Gender, Ethnicity, Graduation, Retention, Persistence, Academic Support, At-risk, LASSI

# IDENTIFICATION OF AND RELATIONSHIP BETWEEN LASSI SUBGROUPS AND THEIR CORRESPONDING ACADEMIC PERFORMANCE

Only one third of all beginning freshmen possess the necessary skills, both academic and emotional, to compete in the higher education environment (Bettinger & Long, 2009; Chen, Wu, & Tasoff, 2010). Even worse, approximately three of five students seeking associates degree are required to enroll in developmental coursework and one in four students seeking their bachelor's degree do the same (Parker, 2011). Unfortunately, this skills deficit has not been contained within the halls of academia, instead progressing into the workforce resulting in concerns from employers and politicians alike (Bridgeland, Milano, & Rosenblum, 2011; Hart Research Associates, 2015; Hodge & Lear, 2011). Educators, particularly those at postsecondary institutions, must deal not only with the burden these issues cause, but also face public scrutiny for the continued existence of these issues (Hart Research Associates, 2015; Sparks & Malkus, 2013).

Higher education institutions experience this burden in a variety of ways, but two remain at the forefront of administrators concerns. First, research indicates that students who lack study skills and techniques (e.g., time management, test-taking strategies) are more likely to drop out of school, limiting their chances of returning to school or graduating (Bailey, 2009; Complete College America, 2012). Second, when combined with performance-based funding, the lack of retention and graduation can affect universities directly through their budgets (Perna, Klein, & McLendon, 2014). As students enroll in developmental coursework attempting to remediate their lacking skills, costing $2 billion annually (Strong American Schools, 2008), they increase their chances

of dropping out of school, and those who remain in school may delay graduation (Ishitani, 2006; Parsad & Lewis, 2003).

## Educational Significance

Throughout the existing literature, the assessment and evaluation of study skills programs has focused on short-term academic performance indicators (API), GPA for example, rather than long-term success indicators (e.g., graduation; Jordan, Parker, Li, & Onwuegbuzie, 2015), study skills assessment instruments (Credé & Kuncel, 2008), or the combination of short-term APIs and study skills instruments (Kartika, 2007). However, in reviewing the related literature for this study, only one article was identified in which the long-term impact of formal study skills workshops was investigated (see Jordan et al., 2015). Furthermore, no articles were identified in which the relationship between the Learning and Study Strategies Inventory (LASSI) scales and either long-term APIs or both short- and long-term APIs were examined. Given these findings, this study will help ameliorate the gap in educational literature by investigating the relationships between the LASSI scales and both short-term (i.e., GPA, 1-semester persistence [fall-to-spring]) and long-term APIs (i.e., 1-year retention [fall-to-fall], graduation [4-, 5-, 6-year]). Furthermore, it is hoped that higher education institutions, specifically those with departments that work with students directly concerning study success, retention, and attrition, will benefit from this study by being able to identify specific groups of students, identified based on LASSI scales, to target concerning students' study strategies and their overall academic success. Moreover, it is hoped that educators, employers, and community leaders become more aware of the effect of academic success programs, particularly those concerning study skills and study strategies.

## Purpose and Research Questions

The purpose of this study is to identify subgroups based on the LASSI scale performance scores of study skills workshop series participants and to determine what relationship, if any, exists between these subgroups and their respective short- and long-term APIs. As such, the following two research questions were addressed: (a) What subgroups are identifiable based on LASSI scale performance (e.g., Anxiety, Motivation, Self Testing) for first-semester freshmen (fall, 2003-2008) students who participated in the study skills workshop series?; (b) How does first-semester freshmen (fall, 2003-2008) subgroup membership relate to academic performance indicators, both long-term (i.e., degree completion [4-, 5-, 6-year], 1-year retention [fall-to-fall]) and short-term (i.e., first-semester GPA, 1-semester persistence [fall-to-spring])?

## Conceptual Framework

Given this study's focus on students and the topics being explored (e.g., study strategies, persistence, retention, graduation), Astin's (1984, 1999) theory of student involvement and Tinto's (1997, 2007) theory of student departure/retention served as the framework for this study. Whereas Astin's theory of student involvement revolves around how and why students succeed, Tinto's theory (1997, 2007) counterbalances Astin's by focusing on the causes of and methods to counter student attrition. Crucial to this study is that both authors advocate the use of formal programs to support student success and learning (e.g., a study skills workshop series), thereby increasing student success and decreasing student attrition.

## Review of the Related Literature

For over a century, researchers have actively been examining study skills and their effect on students' academic performance (Moore, Readance, & Rickleman, 1983; Richardson, Robnolt, & Rhodes, 2010), even investigating the smallest of skills and factors and analyzing each part's effect on students' academic performance and success in school (Astin, 1999; Credé & Kuncel, 2008; Richardson et al., 2010; Tinto, 1997). Over the last 10 decades, researchers have conducted numerous studies, with the overwhelming majority of studies supporting the claim that learning and using study strategies and techniques enhances a student's academic performance and involvement (Kartika, 2007; Proctor, Prevatt, Adams, & Reaser, 2006; Robyak, 1978; Sanoff, 2006; Urciuoli & Bluestone, 2013). Given these studies, it is important to learn not only what combinations of skills offer the greatest positive impact on a student's academics but also how these skills can be grouped to maximize students' academic efficiency and productivity.

### Academic Support – A Need

Once ranked number one in the world in regards to education (Abel, 2000), the United States has since fallen to 16th (Chalian, 2012) with an overall educational attainment ranking of 20th globally (Pearson, 2014). Compounding this decline in academic excellence is that 66% of all beginning undergraduate students lack the prerequisite skills necessary for academic life (Bettinger & Long, 2009; Chen et al., 2010), a statistic that is supported by the assertion that anywhere between 20% (Sparks & Malkus, 2013) and 60% (Bailey, 2009; Bettinger & Long, 2009) of all incoming freshmen must enroll in at least one remedial course upon entering college. It has also

been argued that this skills deficit not only negatively impacts higher education but also the workplace as freshly minted graduates fail to perform at the levels required by their employers (Bridgeland et al., 2011; Hart Research Associates, 2015; Hodge & Lear, 2011). Exacerbating the situation, politicians have taken notice, progressing to the President of the United States. President Obama not only acknowledged the nation's lack of educational attainment at the global level, but also issued a mandate to the United States' educational systems to return to the number one position by 2020 (Obama, 2009).

In response to these pressures, educational researchers have studied a variety of methods to improve students' academic performance. One of the most common methods of bolstering students' skills is through the use of academic support programs, which are "provided to students in the effort to help them accelerate their learning progress, catch up with their peers, meet learning standards, or generally succeed in school" (Academic support, 2013, para. 1). Scholars have conducted research regarding formal academic support programs and have reported programs specifically designed to improve students' study skills and techniques have a positive effect on academic performance (Kartika, 2007; Proctor et al., 2006; Robyak, 1978; Sanoff, 2006; Urciuoli & Bluestone, 2013). This bridging of the skills gap is crucial for the continued success of students and their educational institutions.

**Study Skills and Academic Performance**

As study skills have been a topic of research for decades, there exists a plethora of studies that show students who not only know but also apply study skills fare better in school (Credé & Kuncel, 2008; Richardson et al., 2010; Tinto, 1997) and are reported as being more engaged academically (Kartika, 2007; Proctor et al., 2006; Robyak, 1978;

Sanoff, 2006; Urciuoli & Bluestone, 2013). Interestingly, Nicaise and Gettinger (1995) discovered that students who were performing poorly in school often lacked the necessary study skills, but did not lack the talent or intelligence to excel in school. Since then, several studies have been published supporting Nicaise and Gettinger's (1995) claim, thereby providing statistically significant links between study skills and strategies and positive academic performance (Al-Hilawani & Sartawi, 1997; Credé & Kuncel, 2008; Kartika, 2007).

Unfortunately, these researchers studied the relationship between study skills and short-term APIs (e.g., semester GPA, student perception) rather than long-term APIs (e.g., 1-year retention, graduation), a common occurrence in study skills literature (Credé & Kuncel, 2008). In fact, only recently have researchers investigated the long-term effects (e.g., 1-year and 1-semester retention rates) of study skills (Al-Hilawani & Sartawi, 1997; Credé & Kuncel, 2008; Kartika, 2007; Urciuoli & Bluestone, 2013). At the time of the study, only one other study explored the relationship between a formal study skills program and participants' graduation (see Jordan et al., 2015). Due to this emphasis on short-term academic performance within study skills literature, an information deficit exists concerning the relationship between study skills and long-term academic performance.

**Learning and Study Strategies Inventory**

Researchers often use instruments to help determine the effect of study skills on a student population. One of the most extensively used instruments is the LASSI (H & H Publishing, 2011; Hewlett, Boonstra, Bell, & Zumbo, 2000; Prevatt, Reaser, Proctor, & Petscher, 2007). Designed to yield diagnostic or predictive information concerning

students' perceptions of their learning abilities and study skills (Weinstein, 1987; Weinstein & Palmer, 2002), the LASSI (2nd edition) consists of 80 items, comprising 10 scales each with their own unique characteristics linked to learning strategies related to will, self-regulation, and skill components of strategic learning (H & H Publishing, 2005; Weinstein & Palmer, 2002).

Each of the three learning strategies components is composed of three or more LASSI scales (Weinstein & Palmer, 2002). The LASSI scales associated with the Will learning strategy are Anxiety (student's reported levels of worry and concern), Attitude (student's view of college and success), and Motivation (student's academic drive; Weinstein & Palmer, 2002). Concerning Self-regulation, the LASSI scales that compose this learning strategy component include Concentration (student's ability to focus), Self Testing (student's use of strategies to review information), Study Aids (student's use of academic support to aid learning), and Time Management (student's application of time management techniques; Weinstein & Palmer, 2002). The final learning strategy, Skill, is comprised of three LASSI scales: Information Processing (student's use of visual, verbal, and organizational strategies to learn), Selecting Main Ideas (student's ability to distinguish important information from background information), and Test Taking Strategies (student's ability to check for comprehension; Weinstein & Palmer, 2002). For more detailed information concerning the LASSI's learning strategies and corresponding scales, see Table 4.1.

Despite the use of the LASSI by over 2,000 college campuses in the United States (H & H Publishing, 2005), psychometric data are relatively limited (Flowers, Bridges, & Moore, 2012). Both reliability data and test-retest data for the first edition of the LASSI

provide evidence of the consistency of the instrument (Flowers, 2003; Flowers et al., 2012) as well as strong test-retest correlations (.72 to .85; Weinstein, 1987). Unfortunately, when investigating the second edition of the LASSI, only coefficient alphas for the individual scales were reported (see Table 4.1; Weinstein & Palmer, 2002), thereby casting some doubt on the validity of the instrument. However, given the wide-spread use of the instrument, as well as the testing and research conducted on the first edition of the inventory, the LASSI (2nd ed.) was used for this study.

**Summary**

The positive relationship between study strategies and the academic performance of students has been well documented by researchers over the last 10 decades (Credé & Kuncel, 2008; Richardson et al., 2010). However, the reliance of these researchers on indicators of short-term academic performance, rather than testing longer-term APIs, has left several shelves unpopulated vacuum in the study skills literature (Credé & Kuncel, 2008; Jordan et al., 2015; Richardson et al., 2010). Subsequently, university administrators and faculty have been forced to make decisions in the face of growing scrutiny from politicians and employers for the betterment of their institutions and students with only limited information. Given this situation and the ever-growing skills gap in academia, the need to conduct further research on the long-term effect of study skills, strategies, and techniques on student academic performance is paramount.

## Method

This section consists of two components. The first component concerns the method used to identify program participants as well as an outline of the program in which they participated. The second component encompasses the method used to explore

the relationship between program participants' LASSI scores and APIs. Additionally, to increase understanding, the study's variables are specified and detailed.

**Research Design**

Given the lack of direct control of the independent variables in this study, this study was non-experimental (Johnson & Christensen, 2010; Kerlinger, 1986). This study's data were collected for a 6-year time frame with the intent of predicting the relationship between the program's participants' latent class membership, based on the LASSI scale scores, and APIs. As such, a retrospective predictive model was followed (Johnson, 2001; Johnson & Christensen, 2010), based on Johnson's (2001) two-dimensional (i.e., time dimension and research objective) typology.

**Selection of Participants**

As this study's data are historical in nature, archival institutional data were used. The total undergraduate student enrollment for the large, regional higher education institution in a southeastern state used for this study totaled 79,280 undergraduate students (fall 2003-2008), with a mean of 13,213 undergraduate students enrolled for each fall semester. During this period, first-semester freshmen, the study's target population, accounted for 12,766 students of the total undergraduate student enrollment. First-semester freshmen, by their very nature of being new to the campus, have fewer opportunities to become involved with multiple intervention programs that can potentially influence their academic performance. As such, by studying first-semester freshmen in relation to academic programs, multiple-treatment interference can be addressed (Onwuegbuzie, 2003). Table 4.2 has more information concerning the university's enrollment over the 2003-2008 span.

During 2003-2008 academic years, a 6-week study skills workshop series was administered. Composed of six, 50-minute classes, the study skills instructors covered multiple topics including time management, critical reading skills, stress management techniques, test-taking strategies, and note-taking strategies among other topics. The workshop series was free to all undergraduate students at the university, subsequently all undergraduate classifications were represented in the data (see Table 4.2). However, for this study, participants were identified using a criterion sampling scheme (Creswell, 2008): first, participants must have been first-semester freshmen; second, participants must have chosen to participate in the study skills workshop series; and third, participants must have been enrolled during the fall semesters, 2003-2008. The sample size for the study was 450 first-semester freshmen participants.

**Measures**

Commonly used to assess program and organizational effectiveness in education, APIs in their various forms (e.g., persistence, graduation, written work) can be invaluable to the greater understanding of student success (Banta & Palomba, 2015). Four APIs, in the form of first-semester GPA, 1-semester persistence, 1-year retention, and graduation (4-year, 5-year, 6-year) were used for this study. Additionally, these four APIs were grouped according to time: The former two are short-term APIs and the latter two are long-term APIs.

The first short-term API, first-semester GPA, is one of the most common APIs analyzed in higher education (Kuncel, Credé, & Thomas, 2005), and one in which several study skills researchers have taken an interest (e.g., Credé & Kuncel, 2008; Hassanbeigi et al., 2011; Pepe, 2012). Specifically, first-semester freshmen institutional GPA, as

opposed to transfer or overall GPA, was examined (i.e., interval data). Considering that the sample consisted of first-term freshmen, their coursework was reasonably similar (i.e., comprised of common non-degree specific courses). As such, any differentiation between students' grades, and subsequent GPA, should be ameliorated. The second short-term API, 1-semester persistence, is far less common in the literature. In fact, the term persistence is often used interchangeably with retention and even graduation within educational research (Hagedorn, 2006). To differentiate the terms, the National Center for Education Statistics (NCES) differentiated between persistence and retention, stating that persistence is a "student measure" of academic performance, whereas the term retention should be used as an "institutional measure" for student success (Hagedorn, 2006, p. 6). Whatever the textbook definition is, academicians have used the term persistence in relation to student matriculation over time. For this study, the term persistence was identified specifically as 1-semester persistence (i.e., returning to school the following spring semester). Within these data, persistence was a dichotomous variable with 1 representing that the student returned the following spring and 0 indicating the student did not return.

Although short-term APIs (e.g., GPA, student perception, instrument scores) commonly are explored within the study skills research community (Credé & Kuncel, 2008), long-term APIs are practically ignored (Jordan et al., 2015). The first long-term API is retention, which the NCES (2015b) defines as the rate at which students remain continuously enrolled from the fall semester to the fall semester of the following year. Using this definition, retention was a dichotomous variable with 1 representing the student was retained and 0 representing the student was not retained. The final long-term

API is graduation. The NCES (2015a) defines graduation as the percent of full-time degree-seeking students who finish their degree within 150% of the average time necessary to earn their degree (i.e., 6 years for 4-year institutions). For this study, graduation will not be a percent, but a dichotomous variable with 1 indicating a student graduated and 0 indicating a student did not. Further, this variable was examined in 4-year, 5-year, and 6-year increments.

Although the LASSI can be used as a pre- and post-test instrument, for the analyses used in this study only the post-test is of interest. The inventory, now in its second edition, is a paper-and-pencil instrument used to measure students' use of study techniques and learning and can be employed as a diagnostic and a predictive instrument (Weinstein & Palmer, 2002). The LASSI contains 80 multiple-choice items that follow a 5-point Likert scale, which ranges from *very typical of me* to *not at all typical of me*. The inventory consists of three aspects of strategic learning (i.e., skill, will, self-regulation) which are composted of 10 scales, each corresponding to eight inventory items (see Table 4.1; Weinstein & Palmer, 2002). Each of the scales possesses a single score, ranging from 8 to 40, that is determined by summing the numeric equivalent of the student's answer for each of the eight inventory items. The LASSI has a strong internal consistency with each scale's coefficient alpha range from .73 to .89 (see Table 4.1; Weinstein & Palmer, 2002).

**Analysis**

General descriptive statistics were performed for each of the variables composing the study. Furthermore, to identify subgroups or classes of students as reflected by the LASSI scale responses, a latent profile analysis (LPA) was performed (Lazarsfeld &

Henry, 1968). Like latent class analysis (LCA), LPA is considered a person-centered multivariate approach used to identify latent classes present in a population (Collins & Lanza, 2010). Whereas in LCA indicator variables are considered to be categorical, in LPA indicator variables are considered to be continuous (Collins & Lanza, 2010). As each of the 10 LASSI scale scores possesses a possible range of 8 to 40 based on the students' item responses, the variables in question are continuous; therefore, LPA was the most appropriate analysis to identify classes of students.

Once the subgroups were identified, APIs by subgroup were analyzed using descriptive statistics. Furthermore, both multiple logistic regressions and multiple regression were used to identify the relationship between the subgroups and the four APIs. Specifically, multiple logistic regressions were conducted for the 1-semester persistence, 1-year retention, and graduation (4-year, 5-year, 6-year) dependent variables as each is dichotomous (i.e., yes or no; Peng, Lee, & Ingersoll, 2010) and there are multiple independent variables (Thompson, 2006). In contrast to the binary dependent variables required for the multiple logistic regressions, a multiple regression analysis was used to examine GPA given its continuous nature (Thompson, 2006).

## Results

### Latent Profile Analysis

The LASSI scales were used to identify latent groups or classes of students who participated in the study skills courses. Using LPA (Lazarsfeld & Henry, 1968), five classes were evaluated. Provided in Table 4.3 is a summary table of the fit statistics used to identify the optimal number of classes to retain. The 3-class solution fit better than the 2-class solution as given by the LMR-LRT ($p < .001$). The 4-class solution, however,

was not a statistically significantly better fit that the 3-class solution ($p = 0.59$). The other fit indices, LL, AIC, BIC, and SSBIC, are relative fit statistics and as such, fit can be evaluated by comparison; lower values are indicative of better fit. Although, the relative fit statistics continued to decrease, taking all fit indices and statistical tests into consideration, three classes of students were identified based on their final scores on the 10 LASSI scales. A total of 93 (20.7%) students comprised Class 1, 206 (45.8%) students comprised Class 2, and 151 (33.6%) students comprised Class 3.

**Characteristics of the 3-Class Model**

A description of the class memberships is provided in tabular form in Table 4.4 where the means and standard deviations by LASSI scales are provided for each of the classes. Consistently throughout the classes, Class 3 had the highest means, followed by Class 2, then Class 1. A profile plot, visually depicting the class means, is provided in Figure 4.1. As each class possessed correspondingly higher mean scale scores, the classes were named Low Performance, Medium Performance, and High Performance. Being nationally normed, LASSI scale scores possess corresponding percentile scores and these percentiles have been divided into three levels of strengths: area of relative strength (> 75%), area in need of improvement (50%-75%), and area of relative weakness (< 50%; Weinstein, Palmer, & Shulte, 2002). LASSI scale percentiles of the Low Performance group ranged from 15% (Attitude) to 40% (Study Aids), all below the 50% mark (i.e., areas of relative weakness), suggesting "strategies and skills in these areas are not sufficient" for college success (Weinstein et al., 2002, p. 13). The Medium Performance group possessed LASSI scale percentiles ranging from 50% (Attitude) to 65% (Self Testing and Study Aids), indicating that all LASSI scales were in need of

improvement. The final group, High Performance, continued the upward movement of scale percentiles with a range of 70 (Attitude) to 90 (Information Processing and Self Testing). With only one scale below 75%, the High Performance group was primarily composed of areas of relative strength. A series of ANOVAs were conducted to describe the degree to which students' responses to each scale provided information about class membership; the effect sizes were quite large (see Table 4.4). Additionally, the class membership was disaggregated by ethnicity and by gender (see Table 4.5), thereby indicating more women (67.11%) than men (32.89%) volunteered to participate in the study skills workshop series. This difference was greater than the gender breakdown for the university where women (57.34%) outnumber men (42.66%), but by a lower margin. Additionally, African American students, 22.00% of study skills population versus 14.63% institutional population, and Hispanic students, 18.44% of study skills population versus 11.59% institutional population, volunteered in greater numbers than did White students (59.56% of study skills population versus 71.01% institutional population).

**Relationships to APIs**

A multiple regression was used to identify the relationship between group membership and semester GPA, controlling for gender and ethnicity. The data's VIFs (all ~1.00) indicated a lack of multicollinearity. Additionally, the other statistical assumptions necessary for multiple regressions were met (i.e., normality [visual inspection of the Q-Q plots], homoscedasticity [scatterplot shows no relationship], independence [Durbin-Watson = 2.11]). The multiple regression model was found to be statistically significant ($F[4, 449] = 11.85$, $p < .001$) and accounted for approximately 10% of the variance in semester GPA ($R^2 = .10$, $R^2_{adj} = .09$). Indeed, group membership

was a statistically significant predictor of semester GPA (b = .22, β = .19, $p < .001$). The unstandardized coefficient (b) indicated that a member of, for example, the High Performance group was expected to have, on average, a GPA 0.22 points higher than a member of the Medium Performance group. Similarly, on average, a member of the Low Performance group would be expected to have a GPA 0.22 points lower, on average, than a member of the Medium Performance group.

Multiple logistic regressions were used to identify the relationship between LASSI class membership and APIs (i.e., 1-semester persistence, 1-year retention, graduation) among first-semester freshmen, controlling for gender and ethnicity. The data were independent (Durbin-Watsons = 2.06 to 2.26) and did not exhibit multicollinearity as all VIFs ranged from 1.00 to 1.07. Additionally, by means of Box-Tidwell procedures, the data were found to be primarily linear, with the only exception being the Attitude scale ($p = .05$). As there was only one value that departed from the assumptions, multiple logistics regressions were run.

A test of the full model indicated that subgroup membership was not a statistically significant predictor for 1-semester persistence, $\chi^2$ (4) = 5.22, $p = .27$, $N = 450$. The test of the full model also was not statistically significant for 1-year retention, $\chi^2$ (4) = 5.69, $p = .26$, $N = 450$. Concerning graduation, the tests of the full models showed that participation in study skills was not a statistically significant predictor for 4-year ($\chi^2$ [4] = 3.08, $p = .54$, $N = 450$), 5-year ($\chi^2$ [4] = 3.52, $p = .48$, $N = 450$), or 6-year graduation ($\chi^2$ [4] = 2.17, $p = .70$, $N = 450$).

**Delimitations/Limitations**

Archival data, in the form of academic, demographic, and program information, were used for this study. All participants came from a single large, regional higher education institution in a southeastern state during the 2003-2008 (fall-to-fall) academic years. The data for this study only span from 2003 to 2008 span due to changes in GPA policies and methods of calculation at the higher education institution that occurred prior to 2003 and after 2008.

Threats to internal and external validity were investigated and addressed in the hopes of reducing the impact of confounding variables (Johnson & Christensen, 2010). During this process, two threats to internal validity (attrition and maturation) and one external threat to validity (multiple-treatment interference) were found to be of paramount concern for this study. The completion of activities within a study is the foundation of any study; therefore, the failure of participants to complete the program's requirements (i.e., attrition) is a concern for researchers (Johnson & Christensen, 2010). Attrition, also labeled as mortality, only threatens a study when participants no longer participate which, in turn, creates imbalances between the groups within the study (Onwuegbuzie, 2003). For the purposes of this study, the study's long-term format includes the use of multiple groups of participants in addition to comparison groups to help defend against the difficulties that occur through the loss of participants, thereby lessening the impact of mortality.

The second internal validity threat, maturation, concerns the mental and physical processes that affect participants as time passes (Johnson & Christensen, 2010; Onwuegbuzie, 2003). These processes, or actions, can occur in three distinct forms: (a)

long-term, which include such processes as aging; (b) variable-term, which include actions such as learning; and (c) short-term, which include actions such as boredom (Johnson & Christensen, 2010). As this study revolves around a long-term view of student participation in study skills workshops, maturation is important threat that must be addressed. Therefore, instead of using a single variable to measure program effect, multiple variables, including both long-term (e.g., graduation) and short-term (e.g., GPA) factors, were used to determine intervention effect.

The third threat to validity for this study comes externally in the form of multiple-treatment interference. Researchers, administrators, and professors have designed numerous programs employing a variety of formats to help students in practically every way possible. Given this reality in higher education, researchers and program evaluators must be keenly aware of the possibility for multiple-treatment interference, which camouflages the impact of programs on their participants (Onwuegbuzie, 2003). For this study, multiple-treatment interference was addressed by investigating only first-semester freshmen who participated in the study skills workshop series. First-semester freshmen have been in a college setting for the least amount of time, which limits their contact with programs outside the one being studied, which, in turn limits the effect of this external threat.

Another external validity threat to this study is that the participants represent only one institution and were not selected randomly. This reliance upon a subgroup of the population introduces the potential threat of population validity (Onwuegbuzie, 2003). However, the reliance on non-random sampling techniques does not preclude arguing for the representativeness of data as the “explicit comparison of sample characteristics with

those of a defined population across a wide range of variables" enhances the case for representativeness (Wilkinson &Task Force on Statistical Inference [TFSI], 1999, p. 595). Although Wilkinson and the TFSI (1999) referenced convenience sampling in their paper, their argument equally applies to this study and its criterion-sampling scheme, thereby mitigating this external validity threat.

## Discussion

The skills gap between secondary education and college has recently become a topic of interest to educators and policymakers (Sparks & Malkus, 2013). Additionally, several studies have indicated that students not only lack the appropriate skills for higher education, but the skills deemed necessary by employers (Bridgeland, Milano, & Rosenblum, 2011; Hart Research Associates, 2015; Hodge & Lear, 2011). Formal study skills programs and instruction designed to enhance skills have been shown to have a positive effect on academics (Al-Hilawani & Sartawi, 1997; Kartika, 2007; Urciuoli & Bluestone, 2013), thereby filling in this gap. These studies support Astin's (1984, 1999) theory of engagement and Tinto's theory of student departure (1997, 2007), which argue that students who are more actively involved in their studies and those who take advantage of academic support are more likely to excel in academia.

To help assess students' skills, several inventories are used by educational institutions, but the LASSI is the most commonly used instrument in the United States (H & H Publishing, 2011; Hewlett et al., 2000). Nevertheless, little research exists that examines the predictive ability of the LASSI on academic performance, much less on how students might coalesce into distinguishable classes or groups based on LASSI scale scores. Given this lack of research, the results of this study fill a hole in the literature.

Through the LPA, three groups were identified: Low Performance, Medium Performance, and High Performance; the names of which accurately suggest that each of the groups possessed correspondingly higher LASSI scale scores. In regards to each of the APIs, GPA was the only API that resulted in a statistically significant relationship with LASSI group membership. The impact was relatively large with a predicted 0.22-point increase in GPA from Low Performance to Medium Performance and then again from Medium Performance to High Performance. The relationship between the LASSI and GPA is supported within the literature (e.g., Bender & Garner, 2010), but no studies have articulated this connection to GPA in relation to subgroup membership. However, as each of the subgroups possessed higher scale scores than the preceding group, the High Performance group had higher scale scores on all 10 scores than the Medium Performance group, which, in turn, had higher scale scores on all 10 scales than the Low Performance group, it seems to indicate that progressively higher scores on the LASSI led to progressively higher GPAs. This finding is also indicative that skills associated with LASSI scales operate in unison. If students score higher on one scale, they likely score higher on the remaining scales and the opposite can be said to be true, if students score lower on one scale, they likely score lower on the remaining scales. As such, administrators and educators could use the LASSI as a predictor for semester GPA of their student populations. Indeed, this use could allow for the identification of students who may have academic difficulties (i.e., Low Performance subgroup), which would, in turn, allow administrators to offer additional aid and support to boost those student's academic performances. This added boost may have larger ramifications for institutions

as higher student GPAs could transfer to an increase of social capital with parents, policymakers, alumni, and future students (Bowman & Bastedo, 2009; Meredith, 2004).

In reference to the other APIs (persistence, retention, graduation), no statistical significant results were found, thereby questioning the predicative ability of LASSI subgroup membership, particularly in regards to understanding long-term study skills effects. Moreover, class membership was predicated on LASSI scale performance that, in turn, related to a nationally normed percentile. Each class consisted of scores that consisted of one of the three levels outlined in the LASSI: relative strength (High Performance), need of improvement (Medium Performance), and relative weakness (Low Performance). Weinstein, Palmer, and Acee (2002) claimed that students who possessed scale scores below 50% should make it their highest priority to improve those skills as they were "very likely…not sufficient to help you succeed in college" (p. 13). However, if their claim were true, then the academic performance of groups composed entirely of students with skills at this level (i.e., Low Performance group) should be lower than the other two groups, which clearly was not the case, as no statistically significant relationship existed between class membership and persistence, retention, or graduation. However, the time lapse between the study skills program, and therefore the LASSI, and long-term data collection (e.g., 4-year graduation) may have allowed for degradation in the skills learned during the program, reflected in the LASSI scales, thereby providing a potential explanation for the lack of predictive relationship of the LASSI across time. Therefore, further research should be conducted, as the LASSI should not be discounted based on the findings of a single study.

There are several other reasons that the relationship between academic performance and LASSI subgroups should be researched further. First, this study was conducted at only one academic institution. Second, the data were from 2003-2008, which might call into question the generalizability of the data to current cohorts of students. Additionally, very few studies have been conducted using the LASSI (2nd ed.); as such, more research should be conducted to determine whether this study's results were an aberrant occurrence, or whether the results are representative of the LASSI's predictive capabilities. Finally, Weinstein, Palmer, and Acee (2016) have just released the LASSI (3rd ed.). The release of a new edition evokes the question as to whether is it even relevant to continue researching the LASSI (2nd ed.) when a more recent version exists.

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Table 4.1

*LASSI Components, Scales, Scale Definitions, and Coefficient Alphas*

| Component | Scale | Definition | Coefficient Alpha |
|---|---|---|---|
| Skill | Information Processing | Use of imagery, organization strategies, and other skills to advance learning, recall, and comprehension. | .84 |
| | Selecting Main Ideas | Ability to distinguish significant information from background information. | .89 |
| | Test Strategies | Use of test-taking and test-preparation techniques. | .80 |
| Will | Anxiety | Levels of apprehension and concern relating to academic performance and school. | .87 |
| | Attitude | Mind-set concerning school and achieving success. | .77 |
| | Motivation | Stimulus and preparation to put forth the effort needed to complete activities. | .84 |
| Self-regulation | Concentration | Ability to focus and maintain one's attention on a given process or action. | .86 |
| | Self Testing | Use of strategies to review and identify one's level of understanding of specific information or procedures. | .84 |
| | Study Aids | Use of academic support resources and techniques to learn and maintain information. | .73 |
| | Time Management | Application of time management strategies. | .85 |

*Note*. Weinstein and Palmer, 2002.

Table 4.2

*Enrollment Population by Classification for Fall 2003-2008 Semesters at the Study's Institution*

| Semester | Undergraduate ($N$ = 79,280) | | | | | | Study Skills ($n$ = 2,284) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Sen. | Jun. | Soph. | Fresh. | Fresh., First-Time | Total | Sen. | Jun. | Soph. | Fresh. | Fresh., First-Time | Total |
| Fall 2003 | 3,133 | 2,618 | 2,654 | 1,274 | 1,829 | 11,508 | 45 | 81 | 82 | 54 | 254 | 516 |
| Fall 2004 | 3,378 | 2,836 | 2,644 | 1,298 | 2,144 | 12,300 | 31 | 63 | 86 | 64 | 150 | 394 |
| Fall 2005 | 3,479 | 3,021 | 2,974 | 1,514 | 2,209 | 13,197 | 22 | 69 | 87 | 80 | 130 | 388 |
| Fall 2006 | 3,664 | 3,157 | 3,161 | 1,587 | 2,220 | 13,789 | 13 | 52 | 82 | 81 | 58 | 286 |
| Fall 2007 | 3,861 | 3,349 | 3,205 | 1,511 | 2,240 | 14,167 | 25 | 68 | 103 | 87 | 84 | 367 |
| Fall 2008 | 4,205 | 3,390 | 3,146 | 1,454 | 2,124 | 14,319 | 21 | 64 | 97 | 102 | 54 | 338 |
| Total | 21,720 | 18,371 | 17,785 | 8,638 | 12,766 | 79,280 | 157 | 397 | 537 | 463 | 730 | 2,284 |

Table 4.3

Latent Profile Analysis Summary Table

| Model | LL | AIC | BIC | SSBIC | LRT | *p* | Entropy |
|---|---|---|---|---|---|---|---|
| 1 class | -14060.61 | 28161.22 | 28243.40 | 28719.93 | | | |
| 2 classes | -13356.07 | 26774.15 | 26901.53 | 26803.15 | 1388.41 | 0.00 | 0.89 |
| 3 classes | -13151.50 | 26386.99 | 26559.58 | 26426.29 | 403.15 | 0.00 | 0.85 |
| 4 classes | -13068.50 | 26242.99 | 26460.78 | 26292.58 | 163.57 | 0.59 | 0.84 |
| 5 classes | -13002.32 | 26132.65 | 26395.64 | 26192.53 | 130.41 | 0.31 | 0.83 |

*Note*. LL = log likelihood; AIC = Akaike Information Criteria; BIC = Bayesian Information Criteria; SSBIC = sample size adjusted Bayesian Information Criteria; LRT = Lo-Mendell-Rubin Likelihood Ratio Test for *k* versus *k* -1 class solution.

Table 4.4

*Mean LASSI Scale Scores by LPA Subgroup Membership*

| LASSI Scales | Low | | Medium | | High | | $\eta^2$ |
|---|---|---|---|---|---|---|---|
| | *M* | *SD* | *M* | *SD* | *M* | *SD* | |
| Anxiety | 22.20 | 7.01 | 27.46 | 6.41 | 32.22 | 5.10 | .26 |
| Attitude | 28.98 | 4.64 | 34.15 | 3.08 | 36.34 | 2.49 | .39 |
| Concentration | 23.14 | 4.25 | 29.31 | 3.88 | 34.09 | 3.66 | .51 |
| Information Processing | 24.84 | 4.67 | 29.40 | 5.54 | 34.72 | 3.61 | .42 |
| Motivation | 26.56 | 4.86 | 33.40 | 3.26 | 36.93 | 2.67 | .53 |
| Self Testing | 22.25 | 4.34 | 26.89 | 5.12 | 33.37 | 3.92 | .45 |
| Selecting Main Ideas | 24.59 | 4.25 | 29.72 | 4.11 | 35.13 | 3.16 | .50 |
| Study Aids | 23.73 | 4.15 | 28.08 | 4.53 | 32.48 | 4.11 | .35 |
| Time Management | 20.42 | 4.82 | 27.95 | 4.10 | 32.49 | 4.17 | .51 |
| Test Strategies | 24.81 | 3.98 | 30.71 | 3.61 | 34.96 | 2.85 | .53 |

*Note*. All groups' differences are statistically significant at $p < .001$.

Table 4.5

*LASSI Subgroup Membership by Demographics*

| Ethnicity | Low Performance ($n$ = 93) | | Medium Performance ($n$ = 206) | | High Performance ($n$ = 151) | |
|---|---|---|---|---|---|---|
| | Men | Women | Men | Women | Men | Women |
| African American | 4 | 8 | 20 | 34 | 8 | 25 |
| Hispanic | 4 | 10 | 14 | 25 | 12 | 18 |
| White | 31 | 36 | 32 | 81 | 23 | 65 |
| Total | 39 | 54 | 66 | 140 | 43 | 108 |

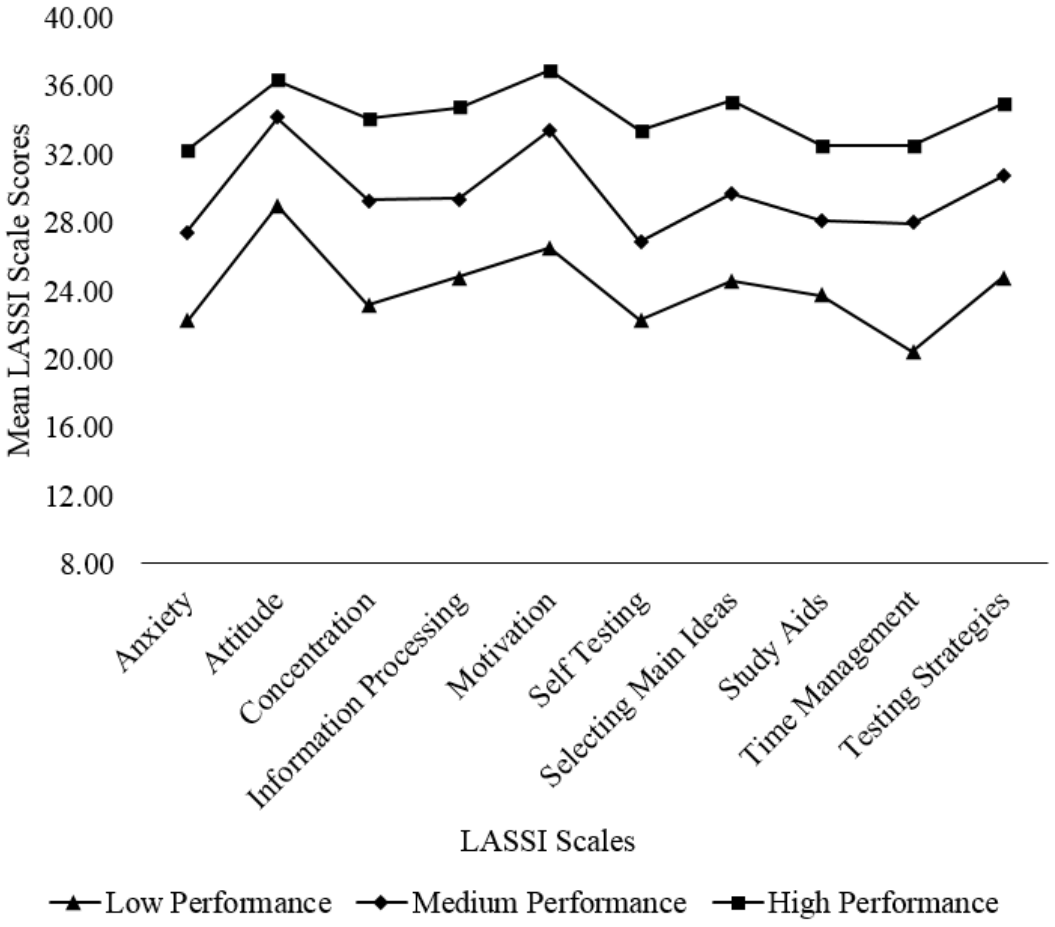


Figure 4.1 *Profile Plot of the Mean LASSI Scale Scores by LASSI Subgroups*

# CHAPTER V

# DISCUSSION

According to Sparks and Malkus (2013), a skills gap exists between what students know and what they need to know to successfully navigate the rigors of higher education. Moreover, several studies have indicated that not only do students not have the skills necessary for college, but that this lack of skills has shifted to the workforce (Bridgeland, Milano, & Rosenblum, 2011; Hart Research Associates, 2015; Hodge & Lear, 2011). According to Tinto (1997, 2007) and Astin (1984, 1999), students who are more actively involved in school are less likely to leave school and more likely to excel academically. Tinto (1997) also stated that programs designed to enhance students' academics are beneficial. As such, researchers have advocated study skills instruction to promote academic performance (Al-Hilawani & Sartawi, 1997; Kartika, 2007; Urciuoli & Bluestone, 2013), thereby promoting student academic success.

As such, the purpose of this journal-ready dissertation was to provide insight into the relationship between study skills and APIs (i.e., first-semester GPA, 1-semester persistence, 1-year retention, and 4-, 5-, and 6- year graduation) distinguished by common at-risk factors (i.e., gender, ethnicity). These relationships were investigated in three ways. First, academic performance was examined in relation to study skills participation. Second, academic performance was examined in relation to the scale scores of the LASSI, a predominant study strategies assessment. Finally, academic performance was examined as it related to subgroups identified within the LASSI instrument.

**Study Skills Participation on Academic Performance**

As a whole, women outperformed men across the ethnic groups at all levels of academic performance. This result corroborated the extant literature (e.g., Kim, 2011; Voyer & Voyer, 2014), and prompts the follow up questions: What can be done to enhance men's academic performance in general and do study skills programs provide a greater benefit to men or women? In regards to ethnicity, White men outperformed Hispanic and African American men, and White women outperformed African American women, all of which is in line with current research (Harper, 2012; Strayhorn, 2010). What differs from the literature is that Hispanic women outperformed all other gender and ethnic combinations in all areas, with the exception of African American women and 1-semester persistence, thereby warranting future research.

Although no statistically significant differences existed for any of the APIs in regards to study skills participation, this finding does not negate the potential effect of study skills instruction. Given that the study skills participation treatment variable was dichotomous (i.e., yes or no), all students who participated in the study skills workshop series were included for the purpose of analysis. As such, students who completed from one to six of the sessions were included in the variable. Those students who failed to complete the study skills workshops (six of six) may lack the necessary motivation, desire, drive, or grit to perform well academically. As such, the participant variable may not be as representative of the program and its potential effect.

To balance this potential lack of representation, the relationship between the number of study skills sessions completed and APIs were investigated. For all APIs, completing more study skills sessions, thereby indicating greater engagement, resulted in

statistically significant increases. Regarding GPA, each additional session attended resulted in a .10 increase in GPA. Concerning the rest of the APIs, in general, for every additional study skills session completed the odds of improved academic performance is increased by 1.12 to 1.17, except for 6-year graduation that shows students who take more classes actually decrease their likelihood of graduating. The 6-year graduation outcome could rightly indicate that students who took study skills courses had greater odds of graduating before the 6-year mark, and the more study skills courses they took, the more likely this outcome became, especially considering the data for 4- and 5-year graduation. Additionally, students may face the lack of financial aid the longer they stay in school, thereby causing higher attrition rates as more time passed (Bettinger, 2004; Scott-Clayton, 2011). The likeliness of prior graduation and potential lack of funds could be a possible explanations of the decreasing odds ratio for 6-year graduation. This statistic also did not take into account students who may have transferred to other educational institutions, left college for the workforce, or left the university for other reasons (e.g., death, military service). However, given the statistical significance of these findings, and the lack of statistical significance inherent in program participation in relation to a comparison group, researchers should narrow the scope of investigation to those students who completed study skills, as opposed to mere participation, to determine the academic effect of study skills programs and instruction. Also, replicating this study with more contemporary data might improve the generalizability of the study's findings.

In regards to educational significance, study skills participation had a positive effect on most APIs. As such, administrators and educators could increase their awareness of study skills programs, and study skills in general, as these APIs (e.g., 1-year

retention, 4-year graduation) serve dual function as academic success markers and key indicators for performance-based funding (Jones, 2013). At the very least, participating in study skills does not hurt student academic performance, and, given this study's results, participation may actually improve academic performance.

**LASSI Scale Scores and Academic Performance**

Although the LASSI is one of the most commonly used study strategies inventories (H & H Publishing, 2011; Hewlett, Boonstra, Bell, & Zumbo, 2000), few studies have investigated the second edition or the predictive relationship between the individual scales and APIs. Moreover, much of the extant literature is mixed concerning the overall effectiveness of the LASSI to assess student academic performance (Flowers, Bridges, & Moore, 2012; Prus, Hatcher, Hope, & Gabriel, 1995). As such, the results are particularly important. The effect of LASSI scales on GPA was statistically significant, which mirrors findings within the literature (Bender & Garner, 2010), but no analyses indicated statistically significant relationships to any of the other APIs. The individual scales of Anxiety and Motivation were statistically significant predictors of first-semester GPA. Specifically, for each point increase on the LASSI scale Anxiety (8-40), GPA improved by .03, whereas for every point increase in Motivation, GPA improved by .05.

According to the Weinstein and Palmer (2002), the Anxiety scale is a measure of how tense or concerned a student is with a given task; as such, a low score indicates high anxiety and high score indicates low anxiety. Perhaps a more apt description of the Anxiety scale is it is a measure of how well an individual copes with anxiety—a low score indicating either a lack of coping skills or a lack of the application of coping skills and a high score indicating the opposite. As such, the positive predictive relationship

between Anxiety and GPA is not only statistically significant, but also educationally significant. The greater students' abilities to cope with anxiety, the higher the GPA they earned. In contrast, there are numerous studies in which the negative effect of high anxiety on student performance are discussed (Alkhateeb & Nasser, 2014; Hersh & Hussong, 2006; Kelly & Barry, 2010). This literature may indicate a growing need for training and support resources to help students counter and cope with the negative aspects of anxiety. For example, students who scored lower on the Anxiety scale could receive focused interventions to minimize their personal anxiety. Another alternative would be to incorporate additional coping skills into established study skills programs, thereby providing instruction for all participants and avoiding the potential marginalization of more anxious students. Either way, educators and administrators would find addressing this topic beneficial for students' psychological and emotional well-being as well as its boost to student GPA.

Like Anxiety, the topic of Motivation warrants further research in higher education for several reasons. To begin with, Motivation, or a students' academic drive (Weinstein & Palmer, 2002), has been shown to have positive correlation with academic performance (Marrs, Sigler, & Hayes, 2009; Nist, Mealey, Simpson, & Kroc, 1990; Sinkavich, 1991). However, students with higher levels of motivation may have been more likely to choose to be program participants as they may have been more willing to participate in a study skills workshop series. This factor could account for the effect of Motivation on GPA. Moreover, students with more drive may possess the ambition and/or willingness to overcome academic hardships, thereby increasing their likelihood of performing at a higher academic level (Wibrowski, Matthews, & Kisantas, 2016;

Zimmerman, Bandura, & Martinez-Pons, 1992). A third possible explanation for the influence of the Motivation scale could be a factor inherent to the study skills workshop series or its instruction may have directly influenced the participants by stimulating their desire to enhance their academic performance, determining which requires further research. Given the potential effect of increased motivation on GPA, students who exhibit low motivation could receive targeted interventions designed to enhance their academic drive, thereby enhancing their academic performance. In contrast, instructors could incorporate techniques and strategies designed to enhance motivation into existing study skills instruction or academic support program, which would avoid singling out less motivated students.

Anxiety and Motivation are both components of the Will category. Unlike scales that represent technical or hard skills, like Selecting Main Ideas (i.e., critical reading), both Anxiety (coping skills) and Motivation (academic drive) are personal or soft skills—more emotionally and psychologically laden (Robles, 2012)—and are sometimes marginalized by educators and administrators due to the difficulty of measuring these skills (Heckman & Kautz, 2012; Kantrowitz, 2005). However, the topic deserves further examination as employers and students place value on these soft skills (Williams, 2015), especially given the study's findings.

However, several researchers have criticized the LASSI, arguing that it does not truly measures what it is supposed to measure (Melancon, 2002; Prus et al., 1995). For example, Time Management is a skill crucial to academic and work pursuits alike (Williams, 2015); however, no connection to APIs was identified for this scale in this study. In fact, analyses indicated that LASSI scales were not associated with five of the

six APIs tested (i.e., 1-semester persistence; 1-year retention; 4-, 5-, 6-year graduation). Similar findings can be found in other studies in which only predictive relationships for short-term outcomes and only in relation to specific scales were reported. For example, Marrs et al. (2009) reported that only Motivation had a predictive relationship to course letter grades, whereas Seabi (2011) identified Attitude, Anxiety, and Test Strategies as predictors for end-of-course exams. These limited relationships between scales and outcomes may support LASSI critics as they question whether or not the LASSI captures the skills accurately.

Several researchers have investigated the predictive relationships between the LASSI and short-term academic performance. Alkhateeb and Nasser (2014) reported the LASSI was a beneficial student diagnostic tool, had statistically significant pre-post results (~5-week span), but at lower rates than Weinstein and Palmer (2002) reported, and had statistically significant effect on semester GPA. Cano's (2006) and Dill, Gilbert, Hill, Minchew, and Sempier's (2014) studies mirrored the LASSI's impact on GPA in reference to end-of-year GPA. Additionally, when referencing LASSI's use as an intervention or program assessment, Seabi (2011) found statistically significant predictive relationship in reference to end-of-year exams. Marrs et al. (2009) noted similar findings in reference to end-of-course letter grades. All of these studies focused on the short-term relationship between LASSI scale scores and achievement; however, no studies were found that investigated the long-term relationships between the LASSI and academic achievement (e.g., graduation). Given that the results of this study indicated that no predictive relationship existed between LASSI scale scores and 1-year retention or graduation (4-, 5-, or 6-year) should cause educators and administrators to pause and ask

why. As has been observed in this study, in long-term scenarios, past a semester or a year, the study skills and strategies learned during the workshop, and assessed with the LASSI, either faded and had no impact on longer term predictors—which broaches the necessity of refresher courses for high risk students, or the LASSI was not effective at actually capturing the students acquisition of study skills. Therefore, as the LASSI is one of the most commonly used inventories in higher education (H & H Publishing, 2011; Hewlett et al., 2000) in regards to study and learning strategies, a better understanding of the LASSI (2nd ed.) is imperative for educational administrators and program coordinators to further their comprehension of the instrument's strengths, weaknesses, and intended uses so that they may better assess and evaluate academic support and study skills programs.

**LASSI Subgroups and Academic Performance**

To help assess students' skills, several inventories are used by educational institutions, but the LASSI is the most commonly used instrument in the United States (H & H Publishing, 2011; Hewlett et al., 2000). Nevertheless, little research exists that examines the predictive ability of the LASSI on academic performance, much less on how students might coalesce into distinguishable classes or groups based on LASSI scale scores. Given this lack of research, the results of this study fill a gap in the literature.

Through the LPA in Study 3, three groups were identified: Low Performance, Medium Performance, and High Performance; the names of which accurately suggest that each of the groups possessed correspondingly higher LASSI scale scores. In regards to each of the APIs, GPA was the only API that resulted in a statistically significant relationship with LASSI group membership. The impact was relatively large with a

predicted 0.22-point increase in GPA from Low Performance to Medium Performance and then again from Medium Performance to High Performance. The relationship between the LASSI and GPA is supported within the literature (e.g., Bender & Garner, 2010), but no studies have articulated this connection to GPA in relation to subgroup membership. However, as each of the subgroups possessed higher scale scores than the preceding group, the High Performance group has higher scale scores on all 10 scores than the Medium Performance group, which, in turn, has higher scale scores on all 10 scales than the Low Performance group, it seems indicate that progressively higher scores on the LASSI led to progressively higher GPAs. This finding is also indicative that skills associated with LASSI scales operate in unison. If students score higher on one scale, they likely score higher on the rest and the opposite can be said to be true, if students score lower on one scale, they likely score lower on the rest. As such, administrators and educators could use the LASSI as a predictor for semester GPA of their student populations. Indeed, this use could allow for the identification of students who may have academic difficulties (i.e. Low Performance subgroup), which would, in turn, allow administrators to offer additional aid and support to boost those student's academic performance. This added academic boost may have larger ramifications for institutions as higher student GPAs could transfer to an increase of social capital with parents, policymakers, alumni, and future students (Bowman & Bastedo, 2009; Meredith, 2004).

In reference to the other APIs (persistence, retention, graduation), no statistical significant results were found, thereby questioning the predicative ability of LASSI subgroup membership, particularly in regards to understanding long-term study skills effects. Moreover, class membership was predicated on LASSI scale performance that,

in turn, related to a nationally normed percentile; each class consisted of scores that consisted of one of the three levels outlined in the LASSI: relative strength (High Performance), need of improvement (Medium Performance), and relative weakness (Low Performance). Weinstein, Palmer, and Shulte (2002) even claimed that students who possessed scale scores below 50% should make it their highest priority to improve those skills as they "very likely…not sufficient to help you succeed in college" (p. 13). However, if this claim were the case, then the academic performance of groups composed entirely of students with skills at this level (i.e., Low Performance group) should be lower than the other two group, which clearly was not the case, as no statistically significant relationship existed between class membership and persistence, retention, or graduation. However, the time lapse between the study skills program and long-term data collection (e.g., 4-year graduation) may have allowed for degradation in the skills learned during the program, reflected in the LASSI scales, thereby providing a potential explanation for the lack of predictive relationship of the LASSI across time. Therefore, further research should be conducted, as the LASSI should not be discounted based on the findings of a single study.

There are several other reasons that the relationship between academic performance and LASSI subgroups should be researched further. First, this study was conducted at only one academic institution. Second, the data were from 2003-2008, which might call into question the generalizability of the data to modern cohorts of students. Additionally, very few studies have been conducted using the LASSI (2nd ed.); as such, more research should be conducted to determine whether this study's results were an aberrant occurrence, or whether the results are representative of the LASSI's

predictive capabilities. Finally, Weinstein et al. (2016) have just released the LASSI (3rd ed.). The release of a new edition evokes the question as to whether is it even relevant to continue researching the LASSI (2nd ed.) when a more recent version exists.

**Conclusion**

In summation, the students' academic performance substantiated current literature regarding gender, women possessed higher academic performance than men did, and ethnicity, White students outperformed Hispanic and African American on average. However, the identification of Hispanic women as the academic leaders within the study was an unforeseen result, giving rise to multiple questions: Was this finding a singular occurrence? Is this finding associated only with the program/school/state or is it a national phenomenon?

Regarding study skills participation, when compared to a non-participant group, there appeared to be no difference, but this analysis included all study skills participants, including those who only attended one session; however, analyses regarding attendance indicated a statistically significant relationship between study skills attendance and APIs in that students who attended more did better. These results produce some concern regarding the validity of grouping all study skills participants into a single variable for analysis; as such, further research should be conducted.

The usefulness of the LASSI instrument, which has been in use since the 1980s (Weinstein, 1987) and is used by over 2,000 educational institutions (H & H Publishing, 2005), to predict academic performance is something that all educators and administrators should take note. Although this dissertation's findings discovered a positive relationship between LASSI scale scores and LASSI subgroup membership and

GPA, a finding substantiated by several other authors (e.g., Bender & Garner, 2010; Cano, 2006; Dill et al., 2014), no other statistically significant relationships were identified with 1-semester persistence, 1-year retention, or graduation (4-, 5-, or 6-year). The findings of this dissertation should not be viewed as a singular condemnation of the LASSI, rather as an argument for further investigation because no other studies were found that investigated the long-term implications of the LASSI on academic performance. The LASSI never mentions a maximum time of efficacy, therefore it may only have limited effect on traditional institutional markers of success. However, in regard to the LASSI scales, this dissertation, along with other studies (e.g., Flowers et al. 2012; Prus et al., 1995) calls into question whether the individual scales measure what they are purported to measure.

The findings further the research regarding the efficacy of a formal study skills program and the LASSI instrument, thereby enhancing the literature so educational personnel may make more informed decisions regarding budgets and potential funding of student support programs. Additionally, program coordinators and administrators should further the predictive power of the LASSI and the long-term effect of their study skills programs on academic performance. Given the importance of student success to the financial (DeBerard, Spielmans, & Julka, 2004; Jones, 2013; Perna, Klein, & McLendon, 2014) and social capital (Bowman & Bastedo, 2009; Meredith, 2004) of higher education institutions, further research into the topics of academic support, study skills, and program assessment instruments (e.g., LASSI) should be a priority.

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# APPENDIX

Institutional Review Board
Office of Research and Sponsored Programs
903 Bowers Blvd, Huntsville, TX 77341-2448
Phone: 936.294.4875
Fax: 936.294.3622
irb@shsu.edu
www.shsu.edu/~rgs_www/irb/

| | |
|---|---|
| DATE: | March 7, 2016 |
| TO: | John Jordan [Faculty Sponsor: Dr. Susan Skidmore] |
| FROM: | Sam Houston State University (SHSU) IRB |
| PROJECT TITLE: | *Study Skills and Academic Performance [T/D]* |
| PROTOCOL #: | 2016-02-28603 |
| SUBMISSION TYPE: | INITIAL REVIEW |
| ACTION: | APPROVED |
| APPROVAL DATE: | March 4, 2016 |
| **EXPIRATION DATE:** | **March 4, 2017** |
| REVIEW TYPE: | EXPEDITED |
| REVIEW CATEGORIES: | 7 |

Thank you for your submission of your **Initial Review** for this project. The Sam Houston State University (SHSU) IRB has APPROVED your submission. This approval is based on an appropriate risk/benefit ratio and a project design wherein the risks have been minimized. All research must be conducted in accordance with this approved submission.

This submission has received **Expedited** Review based on the applicable federal regulation.

Please remember that informed consent is a process beginning with a description of the project and insurance of participant understanding followed by a signed consent form. Informed consent must continue throughout the project via a dialogue between the researcher and research participant. Federal regulations require each participant receive a copy of the signed consent document.

Please note that any revision to previously approved materials must be approved by this committee prior to initiation. Please use the appropriate revision forms for this procedure which are found on the Application Page to the SHSU IRB website.

All UNANTICIPATED PROBLEMS involving risks to subjects or others and SERIOUS and UNEXPECTED adverse events must be reported promptly to this office. Please use the appropriate reporting forms for this procedure. All Department of Health and Human Services and sponsor reporting requirements should also be followed.

This letter has been electronically signed in accordance with all applicable regulations, and a copy is retained within Sam Houston State University IRB's records

Sam Houston STATE UNIVERSITY
A Member of The Texas State University System

**Institutional Review Board**
**Office of Research and Sponsored Programs**
**903 Bowers Blvd, Huntsville, TX 77341-2448**
**Phone: 936.294.4875**
**Fax: 936.294.3622**
**irb@shsu.edu**
**www.shsu.edu/~rgs_www/irb/**

All NON-COMPLIANCE issues or COMPLAINTS regarding this project must be reported promptly to this office.

This project has been determined to be a Minimal Risk project. Based on the risks, this project requires continuing review by this committee on an annual basis. Please use the appropriate forms for this procedure. **Your documentation for continuing review must be received with sufficient time for review and continued approval before the expiration date of March 4, 2017. When you have completed the project, a Final Report must be submitted to ORSP in order to close the project file.**

Please note that all research records must be retained for a minimum of three years after the completion of the project.

If you have any questions, please contact the IRB Office at 936-294-4875 or irb@shsu.edu. Please include your project title and protocol number in all correspondence with this committee.

Sincerely,

Donna Desforges
IRB Chair, PHSC
PHSC-IRB

This letter has been electronically signed in accordance with all applicable regulations, and a copy is retained within Sam Houston State University IRB's records

# VITA

**John Jordan**

## EDUCATIONAL HISTORY

Doctor of Education (August 2016) student in Educational Leadership, Sam Houston State University, Huntsville, Texas. Dissertation title: "Academic performance: A retrospective investigation of study skills and LASSI performance."

Master of Education (May 2008) student in Curriculum and Instruction, Sam Houston State University, Huntsville, Texas.

Master of Arts (May 2005) in History, Sam Houston State University, Huntsville, Texas.

Bachelor of Arts (May 2003) in Philosophy, Sam Houston State University, Huntsville, Texas.

## ACADEMIC EMPLOYMENT

Director of Academic Support Programs, Student Advising and Mentoring Center, Sam Houston State University, August 2014 – present. Responsibilities include: Leading and supervising departmental personnel, hiring and training of new personnel, developing new academic support and mentoring programing and training, assessing and evaluating program effectiveness, analyzing data and writing reports, and liaising with internal and external associates.

Pool Lecturer, Department of History, Sam Houston State University, August 2005 – December 2009, August 2010 – May 2015, January 2016 – present. Responsibilities include: Designing and implementing course curriculum, assessing student learning, and providing academic guidance to students in survey history courses.

Associate Director of Academic Support Programs, Student Advising and Mentoring Center, Sam Houston State University, June 2012 to July 2014. Responsibilities included: Supervising Academic Improvement Mentoring (AIM) programs; supervising and administering Study Skills programs, training, and development; provided academic mentoring to students; analyzing data and writing reports; disseminated Academic Support Programs information and goals to internal and external associates; and liaising with internal and external associates.

Academic Mentor, Student Advising and Mentoring Center, Sam Houston State University, August 2005 – May 2012. Responsibilities included: Providing academic mentoring and support to students, data collection and report writing, and liaising with internal and external associates.

Pool Lecturer, Department of First Year Experience, Sam Houston State University, August – December of 2006-2013. Responsibilities included: Designing and implementing course curriculum, assessing student learning, and providing academic guidance to incoming freshmen.

Graduate Teaching Assistant, Department of History, Sam Houston State University, August 2003 – May 2005. Responsibilities included: Taking attendance; grading quizzes, exams, and other assignments; providing one-on-one tutoring.

## PUBLICATIONS

Story, C., Ferguson, M., & Jordan, J. (2015). Professional mentoring for undergraduate students on academic suspension: An intervention. In Dominguez, N. & Gandert, Y. (Eds.). *8th Annual Mentoring Conference Proceedings: New Perspectives in Mentoring: A Quest for Leadership Excellence & Innovation*. Albuquerque, NM: University of New Mexico.

Jordan, J., Parker, M., Li, X., & Onwuegbuzie, A. J. (2015). Effect of study skills program participation on undergraduate student academic performance. *International Journal of Education*, *7*(1), 247-265. doi:10.5296/ije.v7i1.6888

Jordan, J. (2013). Academic advising and challenges in boosting graduation rates. In R.M. Bustamante (Ed.). *Collection of cases in higher education leadership*. Dubuque, Iowa: Kendall-Hunt.

## PRESENTATIONS AT PROFESSIONAL MEETINGS

Jordan, J., Wachsmann, M. S., Hoisington, S., Gonzales, V., Valle, R., Lambert, J., Aleisa, M., Wilcox, W., & Onwuegbuzie, A. J. (2016, April). *Collaboration patterns as a function of article genre among mixed researchers: A mixed methods bibliometric study.* Paper presented at the annual meeting of the American Educational Research Association, Washington, DC.

Jordan, J., & Roberts, J. (2015, December). *Student support services assessment: Moving beyond headcounts*. Presented at the annual meeting of the Southern Association of Colleges and Schools Commission on Colleges, Houston, TX.

Story, C., Ferguson, M., & Jordan, J. (2015, October). *Professional mentoring for undergraduate students on academic suspension: An intervention*. Paper presented at the annual meeting of the University of New Mexico Mentoring Institute, Albuquerque, NM.

Arellano Arriaga, M., & Jordan, J. (2015, October). *Establishing Leadership In and Through Education – A minority-male initiative.* Presented at the annual meeting of NACADA, Las Vegas, NV.

Wilcox, R., Jordan, J., Wachsmann, M. S., Hoisington, S., Gonzales, V., & Onwuegbuzie, A. J. (2015, August). *Authorship, collaboration, and gender: A multidisciplinary examination of trends among mixed researchers.* Paper presented at the meeting of the Mix Methods International Research Association Conference—Engaging Patients in Health Care Systems: A Pragmatic, Mixed Methods Approach, San Antonio, TX.

Jordan, J. (2015, March). *Academic support programs: The importance of and methods of assessment*. Presented at the Region 7 meeting of NACADA, Baton Rouge, LA.

Onwuegbuzie, A. J., Wilcox, R., Gonzales, V., Hoisington, S., Lambert, J., Jordan, J., Aleisa, M., Benge, C. L., & Wachsmann, M. S. (2015, March). *Collaboration patterns among mixed researchers: A multidisciplinary examination*. Paper presented at the meeting of the Mixed Methods International Research Association Caribbean Conference, Kingston, Jamaica.

Jordan, J. (2015, February). *The predictive value of age, classification, and GPA on academic dishonesty: A secondary canonical correlational analysis.* Paper presented at the annual meeting of the Southwest Educational Research Association, San Antonio, TX.

Jordan, J., Wilcox, R., Paitson, D., & Parker, M. (2015, February). *The role of doctoral studies on the relationships between select doctoral students and their partners: A collective case study.* Paper presented at the annual meeting of the Southwest Educational Research Association, San Antonio, TX.

Parker, M., Wilcox, R., Gonzalez, V., Jordan, J., Lebron, J., Paitson, D., Valle, R., Skidmore, S. T., & Combs, J. P. (2015, February). *Secondary data analysis: Lessons learned in a doctoral level statistics course*. Workshop conducted at the annual meeting of the Southwest Educational Research Association, San Antonio, TX.

Jordan, J., Parker, M., Li, X., Scott, S., & Bullion, A. (2014, February). *Impact of a study skills program participation on student academic performance.* Paper presented at the annual meeting of the Southwest Educational Research Association, New Orleans, LA.

## ACADEMIC AWARD

Dean's Award for Graduate Research, Southwest Educational Research Association, February 2015.

## PROFESSIONAL MEMBERSHIPS

American Educational Research Association (AERA)
Mixed Methods International Research Association (MMIRA)
NACADA
Southwestern Educational Research Association (SERA)